



**ROYAL
AIR FORCE**

Air Power

The Agile Air Force

Edited by Neville Parton



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THE AGILE AIR FORCE

Foreword by CAS

Agility has become something of a buzz-word in the defence community, and like many such terms needs to be treated with a degree of caution in order for the phrase not to become 'all things to all men'. That was part of the rationale behind my decision to focus the 2006 CAS Air Power Conference on the subject of agility – to take the opportunity to explore what the term really means in terms of developing a truly agile Air Force for the 21st Century. Of course, being agile is nothing new for Air Forces. From the very start the Royal Air Force demonstrated Air Power's ability to deliver effects rapidly to parts of the battlespace that were beyond the reach of either the Royal Navy or the Army. Air Forces have also been very quick to harness technology, and adapt their ways of operating to suit changes in the security environment; this has been particularly apparent in recent years, where capabilities designed for high intensity warfighting operations have been adapted to suit the demands of the counter-insurgency campaigns being fought in Iraq and Afghanistan. This did not come about without considerable effort, and a willingness to learn and experiment, both of which are key elements in the agility equation.

The exploitation of technology has been at the heart of Air Power development over the past 100 years but the greatest difficulty, paradoxically, has not been in the development of new technologies, but conceptualising how they should be used to maximum effect. Therefore, whilst technology offers real opportunities for widening the utility of systems across a range of scenarios and, increasingly, provides scope for greater incremental capability enhancement, it is the agility of our people – in the way they think and behave – that sets the framework for how we operate our equipment and exploit new technology. I see this as the main purpose of our Air Power Conferences. To provide - in conjunction with other aspects of our Air Power and Air Warfare education and training – the environment in which we can think and discuss Air Power issues, in order to develop new ideas and concepts for the future.

The papers contained in this publication, which cover the main areas discussed at the Conference, do not define absolutely what is meant by either 'agility' or an 'agile air force'. They do, however, contain some thought-provoking ideas that I would commend to anyone with an interest in developing the agility of the Royal Air Force, which is, of course, one of the key tenets of the Royal Air Force Strategy.

CAS AIR POWER CONFERENCE 2006 – INTRODUCTION

Group Captain Neville Parton

The 2006 CAS Air Power Conference, as outlined in the Foreword by CAS, provided an opportunity for shared thinking and debate on what the term 'agile air force' actually *means* for the Royal Air Force at the beginning of the 21st Century. Indeed, in this regard it followed in a long line of CAS Air Power Conferences, which, from the very start, have enjoyed a common purpose – namely to assist in developing a spirit of intellectual rigour and debate within the RAF. By providing a platform where practitioners, theoreticians and historians could present and discuss a broad range of air power related topics with a degree of relevant historical context, that intent has been achieved. However as attendance at such events is always limited, this publication is intended to allow those who were unable to benefit first hand from the presentations given by the speakers, and thereby, hopefully, to encourage the thinking and debate to continue. For such a document, the main purpose of the introduction is to outline the contents of the papers, thus allowing readers to rapidly identify those areas of greatest interest to them. However it also allows the opportunity to explain why particular topics were chosen, in order to add to the coherence of the piece as a whole.

One of the main reasons for choosing the subject area of agility for the conference was that, if there is a single problem that is at present as generic to military organisations as it is to business, it is the buzzword bandwagon. The move to soundbite politics has resulted in much more emphasis being placed upon terminology, and in a number of quarters unless you use the right terms you are likely not to be taken seriously. Terms such as 'the comprehensive approach', or the entire lexicon of effects-based elements – EBO, EBA, EBP – are frequently used without any common conceptual framework – and of course, in a number of cases, what works well as a strategic level concept becomes much more difficult when it has to be turned into operational or even tactical level realities. Agility could without doubt be seen as one of those terms, and hence the aim of the conference was to provide a number of different perspectives on the subject of agility, looking both within the RAF and without, in order to ensure a greater common understanding of what being a part of an agile air force means for those who serve within them. That was the aim, and you will find that the papers which follow explore a variety of the different dimensions inherent in the term 'agility' with considerable insight, thereby fulfilling the original remit and allowing you to explore the presenter's ideas in detail. It is worth noting that with the exception of the keynote address, almost all of the papers were presented in pairs, and hence are considered in the same manner in this review.

An apposite place to start is, of course, with an appreciation of the fact that in order to have an agile organisation you need to have agile people, and the first two papers, on *Developing Agile Airmen*, and *The Theory of Agility*, by Air-Vice Marshal Peter Dye and Group Captain John Jupp respectively, provide some useful perspectives on this particular area. The former brought out the importance of teaching people *how* to think rather than *what* to think, and the difficulty in achieving the right balance between education and training. The latter explored various aspects of agility, ranging from the need for emotional intelligence to the capacity to deal with ambiguity, and then provided a number of case studies to demonstrate how the ability to improvise and innovate – both hallmarks of agility – are actually being worked out within the Service.

However agility is very definitely not a new phenomenon within the RAF, as the paper by Seb Cox, the Head of the Air Historical Branch, cogently illustrates. His historical analysis of the period from the formation of the RFC and RNAS through to the end of the Second World War is replete with examples, both good and bad, and strongly makes the case that it is not just enough to have agile individuals – the organisation has to be equally responsive or problems will arise. Dr Joel Hayward examines an alternate perspective, looking at the agility that the Luftwaffe displayed in terms of supporting the German Army throughout the first 4 years of World War 2. It is clear that much of the operational advantage that the German Army enjoyed throughout this period resulted from the way that the Luftwaffe could rapidly adapt to meet its needs, and certainly there are lessons here that should not be forgotten. Together both Seb and Joel's organisations are helping the RAF to reshape itself in terms of through-life education of all our people, particularly with regard to understanding our past, as well as our present, and how to derive from both of these lessons for the future – essential if we are to produce warfighters who are well motivated, highly trained and above all agile – a key strategic priority.

An interesting aspect of agility is that there is no such thing as a naturally agile air force, and certainly size is not a key indicator as is amply demonstrated by the next pair of papers. In the first the Chief of Staff of the USAF, General Moseley, explores what agility means from the perspective of the world's largest air force. Most of the areas that he considers have tremendous resonance in terms of aspects that the RAF is also engaged in examining, although then again, given the long history of mutual co-operation and close support, perhaps this is not really so surprising. But the emphasis on developing people and leaning systems are quite clearly seen as fundamental to developing the USAF for tomorrow. At the other end of the spectrum, Brigadier Lunde from the Royal Norwegian Air Force (RNoAF) provides a unique understanding of just how the RNoAF completely reinvented itself in the space of 6 years, and despite a strength of only 1600 personnel in light blue uniform, is able to provide deployable air transport, support helicopter, air defence, strike/attack, ground-based air defence, and command and control elements world-wide. He also points to a possible model for Europe in the future, in the shape of the EPAF Expeditionary Air Wing (EEAW), which provides significant agility by leveraging across national boundaries.

However agility, as already pointed out, requires more than just a good 'front of house', and Air Commodore Bollom's paper considers the part that the 'lean' approach has to play in terms of increasing agility within the logistics area. This presents a strong defence for leaning, and appositely points out that simply having 'fat' in a logistics system does not equal resilience – what is important is having the capacity to deal with the unexpected. The application of the same approach to the procurement of modifications also makes for interesting reading, and in particular the part that this approach can play in making the introduction of new capabilities both quicker and more affordable. It is heartening to know that DLO and DPA IPTs are managing to produce innovative support arrangements that produce greater levels of availability at the front line at lower cost – and yet still manage to provide agility in terms of meeting operational demand.

The final paper comes from the one of the best-known contemporary writers on air power, in the shape of USAF Colonel (retired) Phil Meilinger, who has memorably been described as the 'Clausewitz of the Air'. This provides, amongst other elements, a timely reminder of what air power brings to the joint battle, and especially the fact that this is not a 'free good' – gaining air superiority costs – and in our case, as for the USAF, that includes convincing doubters in

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peacetime of the need to spend to ensure capability when it comes to war. It also clearly points to the need for mental agility on all our parts if we are to cope with the changes in warfare that are occurring, and to be able to understand, and more importantly explain, some of the paradoxes that air power presents. This of course accords with another of our strategic priorities, that of improving our ability to clearly articulate the contribution that air power in general, and the RAF in particular, makes to UK defence.

Taken as a whole, these papers provide a unique opportunity to explore the concept of agility in terms of its application across the spectrum of air power, and all of them provide food for thought. As CAS has noted in his foreword, whilst they do not represent either a complete or unique view of agility in this regard, they do represent a useful resource for anyone with an interest in air power. And this is one of the areas that we do need to concentrate on, as evidenced in a number of the papers – enhancing our ability to explain what air power is, and does, to a broad range of audiences – and perhaps most crucially, in language that they understand. Being able to do this effectively will certainly require a considerable degree of mental agility, and the contents of this publication are intended to aid in developing that particular aspect – enjoy!

Group Captain Neville Parton
Director of Defence Studies (Royal Air Force)
Defence Academy, Shrivenham, 2007

DEVELOPING AGILE AIRMEN

Air Vice-Marshal Peter Dye

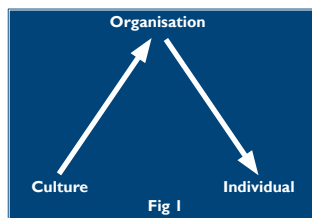
Introduction

There is a temptation at conferences, focussed as they must be on a specific, topical theme, to dramatize one's arguments – if not to create a sense of urgency. So, before I go any further, I should make it clear that I do not believe we are at a cross-roads, somehow caught between the non-agile past and the agile future. In fact, the Royal Air Force has always been agile in the way that it employs people and in the way that individuals respond to change and the unique demands of operations. However, we live in an increasingly dynamic environment where the only certain thing about the future is that there will be less certainty. Increased agility therefore will be the foundation for continued operational success. But, how do we achieve this - at both the corporate and individual level? My intention today is to set the scene, to indicate where we are and how we might meet the challenge in the future.

Definitions (and some Questions)

So, what defines the agile airman? Implicitly, you might expect me to include the characteristics of agility in people – alertness, liveliness, suppleness, etc. You will not be surprised, therefore, to find I define agility as the sum of the personal qualities that deliver: adaptability, robustness, flexibility and responsiveness. We can all visualise these characteristics, but, are these natural (innate) or can they be created and developed? If they can be created and developed (which after all is my topic), is this best achieved through 'hard' competencies or is it more about mindset, about approach and about attitude? In short, are we talking about education rather than training? But is it sufficient just to have agile individuals, in other words what needs to be in place to allow an agile airman to act in an agile fashion – do we have the enabling structures and culture? In fact can people be implicitly agile but prevented by structures from exercising this agility – or perhaps we should seek to make structures agile, in order to allow them to carry the less agile amongst us?

To help conceptualise these issues, I offer the following model (Fig 1) that suggests there are 3 elements in Developing the Agile Airman:



I will return to this model in due course, but for the present it is sufficient to say that these are not discrete elements and that agility arises from their complex interaction.

So where have we come from?

This is not intended to be a detailed historical analysis - after all, you will get a professional view later this afternoon. However, it can be argued that the RAF was at its most agile in the late 1920s – when we were of a roughly similar size (35,000 uniformed personnel). Trenchard recognised that he had to invest for the future and provide solid foundations on which the Service could later build. Budgetary pressures, the jealousies of the other Services and the lack of

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an overt military threat to UK, forced Trenchard to be frugal but did not stop him being versatile and opportunistic - placing key people in key posts - and putting substantial resources into training and education. Developing and sustaining a strong ethos/esprit was central to his thinking. The lessons I draw from this are that you need to invest for the future (in organisation, culture and the individual), avoid short-termism, and decide on your vital ground.

The RAF in WW2 was very large (over 1 million strong) – which was in itself a testament to the success of Trenchard's strategy. The RAF, and air power in general, was crucial to Allied success on land, at sea and in the air - in every theatre of operations. However, with expansion came a very large staff and arguably a price-tag that was unaffordable. In fact, the RAF was so large in 1944 that the Army started to run out of manpower. The further lessons that I draw are that size provides an agility all of its own, resilience can be assured through redundancy, and diversity provides a natural agility; but it comes at a price.

But, less anyone think that the late 1920s or WW2 were without problems, I have two quotations for you to ponder. The first is from the Director of Academic Studies at Cranwell in 1920:

"The officer of the R.A.F.," I used to say, "has got to be a quite different product from an Army or a Naval officer. The time has passed when an officer could afford to narrow his interests down to his sport and his immediate job. You've got to cultivate a liberality of mind, a breadth of outlook, a tolerance and an all-pervading enthusiasm for every side of life at least as big as that of the head of a great business firm. The sole use of this subject, which we call English for want of a better name, is to develop your individuality if you have one, or to bring one to birth if you haven't."¹

At the end of the year he received the following communication from the Air Council.

"Sir,

- 1. I am commanded by the Air Council to inform you that certain aspects of the instruction lately given to the Cadets of the R.A.F. College, Cranwell, were brought to their notice by the Air Officer Commanding.**
- 2. The Council viewed with considerable apprehension the type and method of instruction disclosed and in consequence instructed the A.O.C. to call for your explanation, which they have now received.**
- 3. This explanation has been carefully considered by the Air Council, who are forced to the conclusion that you have adopted methods of instruction which cannot be justified even by the widest interpretation of the duties entrusted to you, and which are not compatible with the ordinary obligations binding on a member of the teaching profession. Some of these methods were moreover, in their opinion, peculiarly unsuitable to an Officers' Training Establishment such as Cranwell.**
- 4. I am to say therefore that the Council regret that they have no option but to call upon you to resign your appointment, such resignation to take effect as terminating your connection with the College before the commencement of the next term.**

I am sir,
Your obedient servant,
W. F. Nicholson."

In effect he was sacked for teaching the cadets how to think rather than what to think. The second quotation is from a retired senior officer writing in 1941:

"I have often wondered why some senior officers in the services show all the symptoms of mental paralysis after the age forty-five or so. It is not because the level of intelligence of candidates for commissions is markedly below the average of educated members of the community. On the contrary, the severe competition for entrance to some branches of the service secures some of the best brains in the country; but as the years roll on the critical faculty seems to become atrophied, and it is interesting now to be able to be able to discuss the phenomenon without being called for one's "reasons in writing" by one's immediate superior.

If a junior officer puts forward a suggestion the implication is that a senior officer might have thought of it, and didn't think of it.

The attitude therefore tends to be that the proposal has been thoroughly considered by wiser and more experienced heads and rejected for good and sufficient reasons.

After being squashed a sufficient number of times according to his tenacity, the junior officer ceases to put forward unwelcome suggestions, and by the time he in turn achieves seniority he has usually absorbed the attitude of his erstwhile superiors."²

The officer who wrote these words was Lord Dowding.

Where are we now?

Before I try to answer this question, it might be worth wondering whether we can identify a period when we were at our least agile? Was it perhaps during the Cold War? Or during the subsequent transition? An objective assessment is probably beyond us, since it is largely event-driven and owes more to hindsight than an innate, measurable quality. What I think we can say (returning to my model) is that - to achieve agility - organisation, culture and the individual must be aligned. Since the 1990s, there have been some very significant shifts in RAF posture, equipment, basing, manpower, structures and training, and we are only part way through the change process:

Organisation. In 1990 the RAF was still organised for the Cold War; and, although, the Service has contracted significantly since then, the shape (that is: basing; Branch and Trade structures; personnel processes; training regimes; Headquarters; etc) have remained essentially the same. For example, only in the last year has the Expeditionary Air Wing concept has gained momentum.

Culture. The Cold War created its own culture. Fixed bases, large numbers of non-deployable personnel, monolithic Headquarters, rigid patterns of training and employment – all produced a transactional mentality – epitomised by the hostility towards education and the prevalent view that if it could not be measured it had no value.

¹. Mais, *All The Days of My Life*, pages 83-117. Hutchinson, London, 1937

². Dowding, *Twelve Legions of Angels*, pages 55-60, Eyre & Spottiswoode, London, 1941

Individual. RAF personnel of the 1990s were the product of the Cold War. The associated mindsets and attitudes were heavily ingrained and have still not entirely disappeared – in fact they may never until my generation retires. While one of our greatest concerns post the Cold War was the perceived erosion of values (frequently identified with contractorisation and civilianisation), we singularly failed to develop a common understanding of what constituted RAF ethos (the vital light blue thread).

Of course, we should not forget that, over the same period, the RAF participated in a series of successful campaigns. But, we did so relying on existing patterns of behaviour and with the equipment to match. Agile individuals were able to provide operational agility but this was in spite of the organisation and the prevalent culture, not because of.

How do we develop agility?

We need look no further than the Chief of the Air Staff's Strategic Priorities. The key elements (detailed in RAF Strategy 2006) for the next 5-10 years require that we:

- Maintain and further develop an agile, adaptable and capable expeditionary Service
- Ensure our structures, organisation and processes deliver rapid and accurate decision making at the right level
- Develop a sustainable manning and personnel strategy that supports our expeditionary capability and takes account of the prevailing social environment

Agility is either stated or implied in all of the above. So do we just recruit naturally agile people? It may be unreasonable to expect people to be agile – in our terms – when we recruit them but should we not seek out the characteristics in individuals that will enable agility? But, do we know what these characteristics are? Innovation and imagination would feature highly on my list but are they so important that we would compromise on, say, pilot skills or an engineering degree because an individual is regarded as potentially agile?

In terms of personality types (Myers – Briggs) do we encourage self assured, outgoing types, or do we seek a balance with the more introspectively inclined? Of course, this presumes that there is such a thing as an agile personality. Frankly, we need to do some more thinking about the qualities and characteristics we seek. Can we make people more agile? I have to say that you will need to look very hard to find the words innovation and imagination in any of our training syllabuses. The Defence Systems Approach to Training does not seem to encourage them, yet these qualities must underpin a truly agile organisation. Is there not a danger that much of our training actually stultifies innovation and imagination, so reducing natural agility?

Anyway, can training make individuals more agile? Or, is it more likely to be education that makes people more agile? Training is the acquisition of competence to achieve specific tasks. Education lies higher up the taxonomy and is more to do with the development of mental processes and attitudes. We might choose to associate 'mental agility' with an 'agile mentality' or perhaps, more accurately, a potentially agile mentality.

Progress

There are signs that we are moving in the right direction; for instance changes to Recruit Training and IOT are now largely in place, with the conceptual building blocks for agility ('how to think not what to think'), principles of mission command and an enhanced education element being integral to these courses. At the same time the Review of Officer and Airmen Development (ROAD) recognises that we need to build coherently on these initial foundations in a progressive, inclusive manner. The early findings confirm that there needs to be a greater emphasis on increasing the though-life training and education of individuals. Furthermore the need for lean thinking has an effect across the entire spectrum of agility. Not only does it involve changes to organisation and process but it demands strong leadership and an enabling culture that is not afraid of challenge. Its impact on individuals, on their sense of empowerment, on where ownership lies and on enhanced self-confidence is significant. Lean is as much about cultural change as it is about process acceleration and eliminating waste.

Although substantial progress has been made, there are some outstanding issues. Changes in training delivery arrangements – notably the Military Flying Training System and Defence Training Rationalisation programmes – may potentially weaken Service ethos. On the other hand, the creation of the COS(Trg) appointment, with end to end responsibilities for all RAF individual training, is a welcome development that will go a long way to bring coherence to an increasingly diverse training environment.

However, are we really confident that we have done all we can to permit/oblige people to be more agile? The application of 'Lean', in coverage, coherence and sustained impact, is not yet where we want it to be. Our Cold War operational posture, with a larger but less flexible force, has gone, but much of the personnel structure remains. Quite simply, we have too many trades and branches. We have relatively inflexible personnel policies. We also do not have a truly responsive manpower planning processes. The recent MCSG study has looked at all these issues and proposed a way ahead. There will be a training and education bill associated with agility – it is unlikely to be a free good – but equally, we cannot afford not to release the innate potential (and agility) in all our people. We must also create a culture in which people feel encouraged, and are supported, in being agile.

This is very much at the heart of Mission Command, but do we have the right structures? Are we still stuck in the Cold War – in organisational terms? In fact, can organisations be agile or are they merely adaptable? Are there organisational characteristics that encourage agility? Do we need flatter structures but, if we do, are they compatible with our military hierarchy? Can agility truly exist within a traditional command chain? While centralised, high level decision-making may suppress an individual's innate agility, is the reverse true? For example, by decentralising manpower control we certainly made stations more agile but ultimately we may have compromised agility at the organisational level.

Keeping People Agile

Agility requires energy. It has fitness implications – for the brain as well as the body. But like physical fitness, it is susceptible to disuse and subsequent atrophy. Loss of agility in individuals is recoverable but it requires its own exercise programme, time and opportunity. Looking to the future, it seems inevitable that there will be further contraction with ever greater budgetary

pressures and continuing operational demands. Agility is both the key to meeting these challenges and the basis for our continued relevance, just as agility was essential to our survival in the late 1920s.

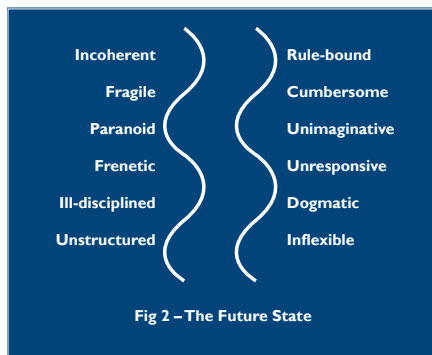
Coherence and Assurance

How can we tell if we are succeeding? How do we measure the agility of individuals (or organisations)? The People Campaign Plan has an important role in this respect. There is clearly a great deal of effort underway to improve agility but it is vital that we maintain coherence across and through the personnel agendas; balancing competing priorities and assessing the people implications in all that we do. But, bearing in mind what I have already said, perhaps there should be an Education Strategy woven into the People Campaign Plan?

Conclusions

However agile we have been in the past, we need to develop greater agility if we are to cope with the future. Much has been done to set in place the hard infrastructure for an agile air force but less for the enabling culture and people policies. CAS's Strategic Priorities provide the hooks for delivering agile airmen together with the necessary permissive structures and processes. If we are agreed as to the nature of individual agility, and we wish to develop agile airmen, we need to acknowledge that implicit agility exists at an individual level in all our people, and seek evidence of agility during the recruitment and training processes. We must nurture our agile talent; being careful not to train out agility in favour of conformity, and reward agility through the assessment process and incorporate it as part of career development. We also need to enhance individual agility through education (mental agility produces an agile mentality!) and of course provide the opportunities to exercise these agile talents – although in our current operational climate such occasions are not difficult to find. It is also up to us to create adaptable organisations that permit, encourage and oblige people to be agile rather than preclude them from being so, and finally, we need to find some way to assess our overall agility, if we want to know whether we are succeeding

I am conscious that much of what I done has been to pose questions. That is how it should be at these events. However, I offer this final model (Fig 2) of what I believe we are trying to achieve. On the right is the non-agile Air Force (on the left is where we also don't want to be). The challenge is how to move our organisation, culture and individuals to the left but not so far to the left that we lose agility in a confused mass of initiatives and change programmes.



THE AGILE AIRMAN THE THEORY OF AGILITY

Group Captain John Jupp

The Chief of the Air Staff has said that “Agility is at the heart of our capability”; that “we need to keep pace with change intellectually” and that “we must make sure that we are just as agile and adaptable as our equipment”¹. He went on to say that “Iraq and Afghanistan have both emphasised the complex, ambiguous nature of the modern battlespace”. The FASOC² seeks to show that Air Power’s distinctive attributes, one of which is agility, are themes for its future development. So what is it that is meant by agility when it is applied to people? We seem to understand it when it is applied to machines and intuitively we think that agile people in this sense are not those gymnasts amongst us. It is some intellectual or mental ability. The FASOC describes it as the ability to use and adapt structures, processes and equipment in innovative ways to achieve the desired effects³. But what does it mean when it is attached to the epithet ‘Airman’.

The Airman’s Perspective

The Airman’s Perspective has been touted since the inception of the RAF and has its genesis in the fact that the airman literally had a view of the whole battlefield as he flew above it.

Hitherto only gallant men with rope and axe had struggled to attain summits to whose height we rose daily, unmindful of the privilege. From this exalted eminence we surveyed the earth... The war below us was a spectacle. We aided it and abetted it, admiring the tenacity of men who fought... to take the next trench thirty yards away. But such objectives could not thrill us, who, when we raised our eyes, could see objective after objective receding fifty, sixty, seventy miles beyond⁴.

Because the air is ubiquitous, extends over everything, and the sphere of influence of the airman is much greater than that of the soldier or sailor, the airman’s view of the battlespace has always tended to the operational rather than the tactical. Today’s airman has a tactical influence within about 150 miles radius of his or her aircraft but is well aware that he may be tasked into another area with totally different dynamics and possibly into a different role within the same sortie. He is operating in 4 dimensions⁵. The airman needs the operational view of the battlespace to cope with this change. Those that support the flying effort need the same broad view. In Operation TELIC for example, the RAF was deployed to 9 different airbases in 7 different countries and operated over the southern 2/3rds of Iraq while it had to be intimately aware of what was happening in the North of the country. Supporting organisations needed to be aware of all of this activity spread over a huge geographical area as well as the other Joint Force components and their requirements. After all, the air component was often (though not exclusively) a supporting component and so needed to understand the entirety of the Joint Force’s business.

¹ An Interview with Chief of the Air Staff Royal Air Force in The Journal of the JPACC, Edition 3 2006.

² Future Air and Space Operational Concept.

³ FASOC, The Beacon.

⁴ Sagittarius Rising, Captain Cecil Lewis, Peter Davis London 1936.

⁵ FASOC, Supporting Essay I, The Airman’s Perspective.

So much for the ‘Airman’ (used here to mean all those who deal with Air Power from an air marshal to an SAC), but what of agility? An MOD paper, ‘The Agile Commander’ defines agility as adaptability⁷, responsiveness⁸, flexibility⁹ and robustness¹⁰.

Flexible Responsive

The words responsive and flexible are defined by reference to change, whether that be changing circumstances or wholesale change. This sort of change is endemic on operations, “no plan survives first contact with the enemy” let alone the change that any military action brings about physically and mentally on those involved. All leaders need to be able to change, to adapt to different circumstances without necessarily having the advice or direction of their superiors except for command intent. (In the RAF, leadership is necessary at any and every rank as can be seen from the stories from SACs and NCOs below). But leaders cannot be agile without knowing the common purpose; knowing the intent allows speed of action. Military action is designed to bring about massive change on the enemy within a short period of time, yet the enemy will need to be dealt with as soon as military action is over. Leading former adversaries through the change in the aftermath of operations – peace enforcement, peace keeping or nation building, will need some considerable skill in this area calling on all the robustness, flexibility, responsiveness and adaptability that our leaders of all ranks are capable of.

Mentally Agile

Innovation in adapting processes to meet the demands of a modern expeditionary Air Force will be vital. But those our processes have evolved to ensure that pitfalls encountered by our predecessors do not catch us out; our changes must ensure that those pitfalls are still avoided, if, of course, they are still relevant. Therefore, knowledge of the process and its purpose are also vital. Put another way, we stop becoming a ‘can do’ air force at our peril, though we need to acknowledge that we cannot do it all, all the time. The need for flexibility and responsiveness on operations is axiomatic, but these attributes are linked to the leadership of change no matter what the circumstances. Change, large and small, is now a permanent part of our lives as the RAF determinedly meets the challenge of remaining relevant in a world that itself is rapidly changing politically, economically, socially and technically. RAF leaders need a flexible and responsive approach, both seeing the needs of their own organisation and recognising, and even anticipating, the needs of the higher organisation for which they work ¹¹. Whether on operations or not, within the uncertainty of change there are opportunities that can be grasped by those agile enough to see them. The empowerment of personnel within the ‘leaning’ process is a powerful example of this.

⁶ D CBM/9 Capping Paper: Agile Command Capability: Future Command in the Joint Battlespace and its Implications for Capability Development.

⁷ Adaptable – Able to adjust or be altered for new conditions. Acclimatize, adjust, attune, become hardened, get used to, reconcile, alter, amend, change, transform.

⁸ Responsive – responding readily and with enthusiasm. Alert, alive, aware, interested, open, perceptive, receptive, sensitive.

⁹ Flexible – able to change or be changed, to adapt to different circumstances. Accommodating, adaptable, cooperative, open-minded, responsive, willing.

¹⁰ Robust – Able to withstand difficult conditions, strong and healthy, determined and forceful. Athletic, brawny, fit, hale and hearty, powerful, strong, tough, vigorous.

¹¹ The Attributes for RAF Leaders – Flexible and Responsive – expands on this and can be accessed from the RAF Leadership Centre website http://www.cranwell.raf.cmil.uk/live/RAF_Leadership_Centre/Index.htm

Innovation is often allied with ‘thinking-out-of-the-box’, but what does it mean to think out of the box, and what is the ‘box’ in the first place? The box is those beliefs and values that are built up through life and experience. The box is those things that have often in the past ensured success and that we therefore take to our next appointment as givens that we do not have to re-examine. Unfortunately for us, this is not always the case and what has worked consistently well in the past will not always do so in the future. However, to be able to question the sorts of beliefs involved here requires serious reflection or the confrontation of those beliefs by an external source. Because of this, it is necessary to consider seriously all the ideas that are brought to the table no matter how extraordinary they may seem at first. It demands that we are **Willing to Take Risks** and to know ourselves and others – to be **Emotionally Intelligent**. There is tension in between the prompts of intellect and our experience. Experience enables pattern recognition, which speeds up response but can be the enemy of innovation. A developed intellect allows for the adaptation of experience to change context. Harnessing intellect and experience offers a route to intuitive decision making that combines and balances risk, benefit and speed.

Mentally and Physically Robust

Adaptability can be taken as another word for flexibility but some of its connotations take the concepts further. While its definition is being able to adjust or be altered for new conditions¹² the synonyms for adaptable include ‘become hardened’, ‘reconcile’ and ‘transform’. There are ideas of robustness and empathy here that must be examined. An adaptable leader must be able to change the nature of the business in hand. He must, at the same time, be able to reconcile different demands and opportunities. Perhaps this may be reconciling the intent of the commander with the situation ‘on the ground’ or the complexities of a peacekeeping mission. This will require **Emotional Intelligence**. Clearly, whenever judgement is being used, the leader must act ethically.

Robustness is a necessity for all military leaders as they must be able to withstand the physical rigours of operations without losing their mental capacity. The physical rigours of operations are not the only physical demands on a leader. Any leader in any sphere can find the demands on their time wearing, they may have to be constantly available to give direction, to reassure their team or members of their wider organisation and feelings of constant responsibility can be draining. The pressures of leadership can be very stressful and are often faced alone. In operations these problems can be increased tenfold. A leader who is not fit, or physically robust, will not long survive his or her tenure in good health. The mental side of robustness demands the determination to carry things through, the forcefulness to get results. A leader must be vigorous and powerful in pursuing the aims and yet flexible and adaptable enough to know when to change direction. Emotional Intelligence to understand the people with whom he is dealing will be essential whether those people are within his or her team or external agencies. Political

¹² Oxford Dictionary and Thesaurus 2001

¹³ See the Attributes for RAF Leaders – Emotional Intelligence and Political Astuteness

astuteness will also be essential¹³.

Able to Handle Ambiguity

On operations, there may not be much time for decisions to be made; away from operations considerable time may be available. Either way the agile airman will need sound decision making skills and the ability to act swiftly when the occasion demands. Certainly to know when a decision needs to be made. Also, in peace or war, military affairs are complex and often shrouded in ambiguity. The ability to handle ambiguity is clearly linked to flexibility and responsiveness, mental agility and the willingness to take risks. It is also vital in being politically astute. The operational friction that causes the fog of war is reasonably well understood; it creates ambiguity. The pace and complexity of modern warfare can also create ambiguity of its own. Consider the battlespace of the Gulf War in 2003; warfighting, peacekeeping and peace support operations were being carried out in one battlespace. The USMC has described this as the 3-block war. This can create immense ambiguity for a leader who has to work within the moral framework expected of his forces in each of those types of operation, and they can be very different with very different imperatives. Certainly decisions will rarely be clear-cut in such a situation. Equally, politics, whether international or national, within a large organisation or in the office, are seldom straightforward. A leader must steer a path through the 'shades of grey' that is morally acceptable and will gain the support of his or her team. A leader can process out ambiguity, find his or her way through it or exploit it¹⁴. Exploiting ambiguity requires strong leadership and works best in situations where there is leadership without authority. Joint, and particularly, multinational operations fit this model perfectly. In peacetime, the model fits in many situations where differing start points, opinions and histories mean that groups working together may not have identical ends in mind. Yet there can be commonalities that should be exploited by our leaders. There has been some research in this area¹⁵ that shows that defining and agreeing the means of advance rather than the goals or ends to be achieved has more effect on productivity; it is essential that this is taken in the inter-organisational field rather than the intra-organisational one. While this may seem contrary to the tenets of mission command where a commander is to define what he wants to be achieved but not how, it must be remembered that he must also explain **why** something is to be achieved and this 'why' is more important than the 'what'. It is the intent that is key and the actions of subordinates must always be in-line with that.

In the political world, the Northern Ireland Peace Process provides an insight into exploiting ambiguity. Defining clearly what 'decommissioning' meant would have held apart the parties to the agreement in intractable positions that would not have allowed any advance. By leaving the end state somewhat vague, both sides were able to move towards a goal by means that were agreed to be a good thing by both sides. Eventually, they arrived at a position where they were both content and peace could be a reality.

Mission Command

Clearly, if agility is to be leveraged there must be room for manoeuvre by all RAF leaders. The philosophy of Mission Command allows this freedom. Mission Command was devised as an Army tactic to overcome the impossibility of a commander being able to communicate with

¹³ See the Attributes for RAF Leaders – Emotional Intelligence and Political Astuteness

¹⁴ See the Attributes for RAF Leaders – Able to Handle Ambiguity.

¹⁵ Inter-organisational Performance, L J Bourgeois

his or her subordinates at all times and because friction, or the fog of war, did not allow him or her to see all that was going on. In the Air component, and as we expand our NEC¹⁶, the limits to the commander being able to communicate with his subordinates and his visibility of the battlespace are largely being removed. However, what cannot be changed is the time element. If subordinates are not to make decisions then there is a limit as to how fast they can be made by the commander as he must move round his or her OODA¹⁷ loop and this takes a finite time. If NEC is subject to such strategic compression then decision speeds will slow down contrary to the intent of NEC to make the pace of operations beyond the capacity of an enemy to respond. If subordinates are to make decisions, then they need the freedom to exploit the situation, to use their agility. This is the philosophy of Mission Command. The art of the commander is to know which decisions he needs to make. He needs to be **Politically Astute**. NEC, however, allows a huge step forward in the clear and unambiguous transmission of the commander's intent to all levels of the organisation so that decisions can be made within its guidance and framework. Equally, with the commander's intent in mind, subordinates can weigh up the consequences of decisions and actions and must have the good **followership**¹⁸ to know when they must seek the commander's view. They must also be able to use constructive dissent at the appropriate time and feed back to their commanders and know when to move to constructive consent. If delegation in this way works as it should, then speed is enhanced and the pure form of manoeuvre warfare envisioned by the architects of NEC can become a reality.

Air operations are controlled through a CAOC¹⁹ which has a massive 3-day rolling planning process that apportions, assigns and schedules all movements in the air environment into an ATO²⁰. Many have stigmatised this as being the antithesis of agility, barely allowing 'centralised control and decentralised execution' to work. Yet the planning cycle should not be confused with the operational imperative; nor should anyone be in any doubt that it is the operational imperative that drives CAOC processes and not the processes themselves. Yet to ensure that the process does not become the master requires a deep knowledge of the system and how to exploit and improve it. The British Army has a 3-day planning cycle but would not stigmatise itself as inflexible. Equally well the processes of all the functions supporting air operations are there to facilitate that support. But process is not the issue, it is more the case of ensuring a joint mindset that is geared from the outset to produce one plan and which recognises the need to bring appropriate influence to bear early enough in the process to identify and derive the intended effect. The attached annexes offer some personal examples of how agility might manifest itself at varying ranks, with greater or lesser responsibilities and in different situations. There are many stories from all specialisations but only a few could be included here. They are not intended as a template for future behaviour but as an insight into agility in practice and it is acknowledged that any particular story will not inspire everyone.

CONCLUSION

We need to preserve the 'can do' ethos of the RAF that drives our performance. We need to train as best we can, anticipating as many of the variables as possible and fully understanding the

¹⁶ Networked Enabled Capability.

¹⁷ Observe Orientate, Decide, Act.

¹⁸ For explanation of followership, constructive dissent and constructive consent, see Followership: The Anvil of Leadership, Professor Keith Grint in Air Force Leadership: Beyond Command? RAF Leadership Centre 2005.

¹⁹ Combined Air Operations Centre.

processes that we have in place. But we need to be masters of the processes and to be able to adapt them to changing circumstances. Some stories of our people's experiences on operations and elsewhere follow; they amply demonstrate the need to improvise within the frameworks and encourage as much innovation as we can in ourselves and others; to be flexible, adaptable, responsive and robust.

There is much in language and how various people interpret it. However, the Attributes for RAF Leaders²¹ cover all this ground and they have been highlighted where they apply in the theory above. Combined with the need to embody the RAF Core Values and act ethically, the philosophy of Mission Command and Followership, knowledge of and effort to behave in accordance with the Attributes for RAF Leaders should enhance agility in the Service.

CAOC COMMAND²² IN OP IRAQI FREEDOM

A modern US CAOC is clearly not yet fully 'NEC', but some parts of it are quite close and perhaps give us an indication of the challenges ahead as NEC matures. In particular, the volumes of information available (literally at the 'click of a mouse') are immense, especially when air operations on the scale of Op IRAQI FREEDOM are taking place. The delegation of decision making was thus the key to maintaining any sense of tempo – essentially **Mission Command** working within the various levels of the CAOC (as well of course as in the cockpits of aircraft). One of the key functions of command in this environment is effective risk management – will the results be worth the risk, either to our own forces or in terms of undesired effects (collateral damage, casualties etc)? While there were clear guidelines for certain decisions – for instance the CFACC himself retained the approval for CSAR packages into all but low risk areas – we also delegated wherever possible.

Ambiguity abounds in such an environment, and the time available to try to gain the best possible information to reach a decision will be different in almost every case. The 'information management' challenges, both across the CAOC and in one's own working area, can be considerable! However, even in the most time critical moments, it is probably worth taking a few seconds to personally check one or 2 facts! I realised fairly early on that I had sent some missions into high threat areas to attack 'high value' targets and they had failed to find anything. On further investigation I found that the intelligence on many of the 'time sensitive' targets (SSMs, SAMs etc) was based on imagery, and that it sometimes took up to 12 – 14 hours to interpret the imagery, given the volume being produced. Clearly, with most Iraqi mobile systems being moved every few hours, there was little point in tasking an aircraft into a high threat environment (such as the Baghdad area) to attack one if it was almost certain that it had moved in the meanwhile! But of course the decision was not always as straightforward; what if the target was potential WMD, and the ISR was only a few hours old, how much risk to take to try to attack it.....? especially if ELINT has just reported possible active SAM radar close by? and your SEAD aircraft have just departed the area for their AAR?and.....etc! Interestingly enough, others had not made this connection and were continuing to search for targets long after they had almost certainly moved. It is probably just as well that the Baghdad 'Super MEZ' turned out not to be quite the

²⁰ Air Tasking Order.

²¹ Warfighter, courageous, Emotionally Intelligent, Flexible and Responsive, Willing to take Risks, Mentally Agile/Physically Robust, Able to Handle Ambiguity, Politically and Globally Astute, Technologically Competent. Able to lead tomorrow's recruit. An explanation of these attributes can be found at <http://www.raf.mod.uk/leadershipcentre/>

²² From an interview with AVM Nickols on his time as one of the CAOC Directors during Op Iraqi Freedom.

threat that we thought it was at the time!

Although sleep was in quite short supply, physical robustness was probably not the most essential requirement of the job; the environment was pretty comfortable, with air conditioning, good food and drink and a decent bed. But the mental robustness required was perhaps far greater than I had ever imagined. The pressure of constantly having to make decisions on which other (sometimes many) peoples' lives were at stake was mentally draining to a degree that I had never before experienced. Unlike many before me, I was fortunate that this level of stress really only lasted for a couple of weeks.

And considerable robustness was also required in dealings with others at times. In the first few days the B52 aircraft were operating alone in N Iraq (because of the Turkish decision not to allow us basing) without either air defence or, more importantly, SEAD support. B52 commanders telephoned the CAOC to express their considerable concerns that the level of risk to their crews during these operations was not being properly considered. Apart from their surprise at dealing with a British officer over the issue, it was difficult explaining to them that we were very well aware of the risks and had considered them extremely carefully, but that the potential strategic significance of not sending them (they were the only support we could provide to the Kurds at that stage) meant that the risk was worthwhile – in campaign terms, even if higher than the individuals in their cockpits felt was necessary!

The agility of our structures and processes is of course highly dependent on the agility of our people. Despite some very able personnel, mature doctrine, and strong joint and Air C2 processes, the CAOC was probably not as agile as it could have been in many ways. This was mainly in the achievement of a smooth transition of work between the various divisions (Strat/ Plans, Ops, ISR, Mobility); as a result, our 'feedback loops' were not always complete (particularly in areas such as BDA) and overall agility suffered. The causes? Probably a mixture of some people who did not understand the processes well enough (training) and some who, although they were well trained, did not have the agility of mind needed in a fast-moving high intensity fight. That we succeeded was mainly because we had plenty of assets and the Combat Ops division proved to be the most flexible and agile I have ever seen (in large part due to some outstanding embedded RAF personnel); this undoubtedly masked a lack of agility elsewhere and the 'seams' between the CAOC's divisions. The lesson? I think that your people must be both properly trained in Air C2 and have the agility of mind to cope with ambiguity and the unexpected; either one on their own is just not sufficient!

A DOB COMMANDER²³

Based on my experiences as a Stn Cdr preparing forces for expeditionary operations, and then subsequently as a DOB Commander, the key 'enablers' to an agile airman are: mindset; preparation; flexibility and adaptability; and empowerment.

The right mindset is to recognise that expeditionary operations are not an aberration in day-to-day routine: they are what we do and the agile, expeditionary airman keenly wants to be involved. He does not recognise the term 'out-of area', because his or her primary operating area is away from home base. Similarly, he does not accept the term 'Main Operating Base', because the natural state of operations is not at home base but on deployment. At the DOB, the right

²³ From Air Cdre Hillier, DOB Commander at Al Udiad on Op TELIC.

mindset involves the relentless pursuit of outcomes: do whatever is necessary to get the job done, tempered with the knowledge and professionalism of knowing what boundaries can and cannot be pushed; make it work and refer problems upwards or out of theatre only as a last resort. This mindset can only be enabled by proper **Mission Command** downwards, articulating the what, not the how, and driving responsibility as close as possible to the point of delivery.

Agility demands preparation, which means seeking out opportunities to build the skills required for rapid deployment and confidence in abilities. Expeditionary training exercises in the UK are, again, not a disruption to routine operations – they are on main effort. I would perhaps have been more cautious in volunteering my Station to establish a new DOB at very short notice had it not been for the level of general preparation for expeditionary operations which we had carried out over the preceding year. This ranged from DOB Command Team training, to self-generated Sector Level Training, to monthly Station ‘readiness to deploy’ checks. Together with the core of my DOB Command Team, I departed at 3 days notice on what was expected to be a 3 day on-site recce, and returned 3 months later after the war. My DOB grew from 13 to 450 personnel in 48 hours: only through preparation and training can you have the confidence that you are ready for such challenges.

Physical and mental fitness are important parts of preparation. For the former, we need to change the overall fitness level of our Service: I still saw too many examples of unfit personnel unable to take their full share of the task, placing an additional burden on others. For the latter, the agile airman’s mindset recognises that the nature of the changed security environment means that current operations are a matter of choice for the UK, and where there is choice there is always opinion. I therefore encouraged my personnel not to be overly focused on widespread public opinion and support. This was not an argument to operate without a sense of higher moral purpose, but simply a pragmatic position where contribution could be measured more by the degree of professionalism brought to the assigned mission, not by its popularity or otherwise.

Flexibility and agility must be the touchstone for expeditionary operations and the agile airman. Do not expect predictability: the character of the operating environment ensures that change is inevitable and the agile airman recognises that in uncertainty there is opportunity. The agile airman does not seek to operate only within trade or specialisation: he or she is a generalist as well as a specialist, ready and willing to turn a hand to whatever needs to be done. At my DOB, some personnel asked shortly after their arrival why the tents required in their technical accommodation area had not been erected, and who would be doing the work. After a reality check, they cracked-on and developed a first-rate complex which became a regular ‘show’ to VIP visitors: the potential in our people is there to be exploited. Similarly, everyone (including aircrew) can fill a sandbag and everyone needs to be able to look after him/herself when living in an expeditionary environment: a periodic erratic water supply is an opportunity for forward planning! The first instinct of some personnel, albeit a minority, on arrival at my DOB was to determine their shift pattern, weekly day off and phone allowance. Re-focusing was required to emphasise that looking after personnel would be a leadership responsibility, not a series of entitlements.

The agile airman recognises the importance of the joint and Coalition operating environment, compromising and falling-in with others’ way of doing business in order to get the job done, whilst still being able to live up to the essence of his or her own Service’s values. Working with

Allies, some activities have value simply because they help build and sustain the Coalition: for many of the 6000 USAF personnel at my DOB, I suspect one of their strongest memories of the UK presence at Al Udeid was the capabilities of 12 first-rate RAF chefs!

The agile airman operating with an expeditionary spirit is required not only at the DOB, but at all points in the reach back process: everyone is doing deployed operations, regardless of their physical location and needs to adapt the processes to achieve the required results. Aircraft ammunition was removed from an AT aircraft en-route to the DOB because it had not been properly demanded: Initial Operating Capability was delayed as a result. Doubtless there are arguments from both sides on this specific issue, but the point is that decisions need to be taken with a full understanding of the operational imperative, not just with a narrow focus on process.

Finally, agility gets frustrated without proper empowerment. Risk ownership lies best with the person best placed to manage it. Judging aircraft explosive safety distance requirements from 3000 miles away in the UK, without any recognition of the impact on coalition partner arrangements, frustrates proper ownership of decisions. Some personnel are just not up to the job: the process of removing them needs to be swift and with a proper balance between sensitivity to the individual and the need to get the job done. When a DOB commander says he does not need more personnel or equipment, trust his or her judgement; hold him or her responsible if it subsequently goes wrong.

A DOB COMMANDER²⁴

The doctrine, SOPs and manuals are great when things are going as expected. You need agility when you move off the beaten path. The operational security issues that surrounded my DOB prevented me from doing a proper recce; hence I was off-piste from square one. I did manage a visit to an exercise at the base, which amounted to a clandestine recce of sorts, but many people vital to a recce could not go. Severely limited on numbers, I took the person I thought most vital – my RAF Regiment Force Protection specialist. It meant that I had to look at other ways of gaining information, like spending considerably more time than usual talking to key Embassy staff. At this stage, there were many issues that required tact and perseverance; for example, STC A5 repeatedly put a media handling team on my party, despite my taking it off several times, explaining that my hosts would not allow the media within 30 miles of the base. The message is, in the spirit of **Mission Command**, trust the DOB Cdr's judgement. He can always be fired if he got it wrong.

On order, I deployed with the set-up team and commenced work to meet the timelines. I was tasked to be ready for ops at maximum rate, within 14 days. This was to include 2 aircraft types and the necessary force protection. This was achieved. Unfortunately, our hosts did not want the Harriers to arrive until it was absolutely certain that hostilities were inevitable. Hence, we could not get diplomatic clearance for them to arrive and I had 22 days from declaration of open for business with no aircraft. This required innovative leadership to prevent people from going off the boil. With no Harriers until further notice, I proposed an early entry for the Canberra PR9 during a visit by the Combined Forces Air Component Commander. It was a classic everyone's a winner solution: the Coalition could use imagery from the aircraft for genuine operational benefit; our

²⁴ From an interview with Air Cdre Kirkpatrick, DOB Commander on Op TELIC.

hosts could use it for their purposes and my people would have something to do to maintain their interest. Our hosts were concerned about the obvious difference in silhouette between Harriers and their aircraft, mindful that the presence of the new aircraft would not be lost on the locals. I asked if the Harriers could arrive at night. Our hosts were surprised that we flew at night and went away to think about it. They came back with the offer to get them in the following night – thereby providing an agility challenge for us, which we met.

For me, my centre of gravity was to ensure that no small tactical incident on base resulted in unintended strategic consequences, with the possibility of mission failure. I was determined to maintain the goodwill of our hosts. This involved spending many more hours than felt healthy in smoke filled rooms, drinking endless cups of sweet tea. It was important to me that the Host Base Commander held us in higher regard than the USAF detachment.

I did not foresee that I would find myself standing in the middle of an airfield on a mobile phone, speaking to a commercial Belgian Boeing 737 captain. Mentioning no identifiable locations, loads, or types, I assisted him in understanding the Terminal Approach Chart (TAP) which had been faxed to him; this was almost illegible before it was sent it as it had been photocopied so many times, but it was the only one available. He wanted reassurance that it was genuine, "because it didn't look right". He wanted me to read the figures out to him so that he could ink them in. In the end I reassured him that I was also a pilot and I was standing in the middle of the airfield, with flatness for a goodly number of miles around, and that he would have to hunt for an obstacle with vertical extent to be able to hit it. He filed a copy of the TAP for his company's records and turned up about 8 hours later with our DOB Guard Force.

One particularly agile moment for one of my team involved the local contract catering staff. A high proportion of the locals at our location were Palestinian. This was bound to lead to the odd tension given the American/British presence, especially if hostilities had commenced. I was concerned at the risk of our food being sabotaged. Relationships with the locals got tense when the first action got underway. The US response was to send down some HUMVEEs containing very large guards in sunglasses heavily armed, complete with knives. I asked my Sqn Ldr RAF Regt officer to go down there and sort things out. He checked in his personal weapon and went to his tent to change into sports kit. He invited the Americans to clear off, then went to the kitchens to drink tea with the caterers, whilst watching Sky News showing Baghdad being bombed. Amazingly, he got the caterers to calm down and go back to work.

One piece of Branch bashfulness affected me considerably and demanded agility. Having deployed 2 hand-picked Air Traffic Controllers, each current on Harrier operations, one a qualified Tactical Air Traffic Controller, it came as a surprise that they were ordered by their Branch sponsor at HQ STC that they were, under no circumstances, to control aircraft. I had not realised that the Ops Spt(ATC) Branch was the only one in our Service to have its utility linked to postcode. I pointed out that the pilots were not familiar with the locality (or Western Iraq), that we all had to drive on the wrong side of the road and that a degree of adaptability could reasonably be expected. I took the situation as far as I could with Strike Command (via the UK Air Component HQ) but Strike ATC would not budge. Unless the controllers were qualified at my particular airfield by RAF ATC examiners (who also did not know the airfield) they could not control and we had no way of qualifying them. I approached the USAF Detachment commander and asked if they had a course to qualify their controllers on their deployed set-up. They did. He

agreed that my controllers could enrol on the course to be familiarised with the equipment and procedures, but that I should be in no doubt that they risked failure if not up to the mark. I was unsurprised when both passed with flying colours and became lynch pins in the combined ATC successes.

I insisted that we had our RAF Regt SOI in the USAF ground defence cell. Agility was certainly needed in this area. We had local troops patrolling outside the wire on our behalf. I was concerned about the potential for a blue-on-blue. It nearly happened when US guards saw movement at night which they were unsure of and which made them want to engage. My RAF Regt SOI heard the beginnings of the 'goat' from his position in the ops room. Excited American voices from a US Army Patriot Battery were radioing the USAF-controlled ground defence cell, reporting suspicious activity just outside the wire. They wanted permission to engage. The RAF Regt SOI took charge of the network, got an assurance that no one was being fired upon and broadcast that there was no reason to engage. He had correctly deduced that the observed movements were local troops acting on our behalf. His intervention prevented a catastrophic blue on blue.

To all prospective DOB Commanders who, like me, harboured the notion that they were going to lead the flying ops from the front in the cockpit - a message: that is not your job. Your primary job is to establish and maintain a network of harmonious relationships between your Detachment and your host, coalition partners, the Embassy, your Air Component HQ, and between all sub-elements of your DOB. By so doing, you will create the necessary conditions to let the squadrons get on and do the business of creating precise campaign effects using air power.

THE COMMANDER COMBAT OPS WITHIN THE CAOC²⁵

As the SOI in charge of Combat Ops, it is vital to have the right team around you. They need to be competent but also to work as a team and their agility is vital to the agility of the organisation. Also it is vital for agility that we had the full support of our superiors, at least 2 up. For TELIC we had a work-up culminating in a full BLUE FLAG at Shaw AFB, South Carolina to create a cohesive team but even so a few people had to be replaced because they were not up to the 'can do' spirit that was necessary to make it work. I likened the CAOC to an orchestra with the various sections fulfilling various roles and the Chief of Combat Ops being the conductor; each individual may be a superb player but the conductor has to make them work as a team to get them to make a good sound. One false note ruins everything; not necessarily from the orchestra of course, it could even be a mobile phone in the audience. When the bomb dropped in the market place on TELIC it made a bad note.

In TELIC, one example of agility, and the lack of it, was known as 'the bridge too far'. There was a bridge in the western desert that needed taking down and we tasked some F16s against it. When they got there it was obscured by cloud so they used JDAM in GPS mode. When we got the BDA the bridge was still intact so we airborne re-tasked some more assets who also used JDAM in GPS mode. After that BDA we had to do it again. In all we sent F16s, F15s and F14s against that bridge and none hit it. The fourth time we sent GR4s. They got there with

²⁵ From an interview with Wg Cdr Hyslop.

bridge not obscured and saw that the coordinates they had been given were slightly wrong so used Enhanced Paveway in the laser mode and took the bridge out. A great piece of 'agility' that enhanced the British reputation in the CAOC for weeks! But there was a lack of agility in the CAOC as the BDA showed all the USAF JDAM impacts to be in the same place away from the bridge, this should have been picked up, the coordinates corrected and the bridge taken out sooner without wasting so much effort.

In Incirlik during Northern Watch I was the DCFACC and we had Tornados in the recce role with us. All the coalition aircraft were fired on most days mostly by AAA. The Iraqis seemed to have a cycle where new gun crews came along and genuinely tried to fire at our aircraft. However, they soon learned what our response was like and to aim progressively further behind the aircraft and act with a lot less fervour. One gun crew, however, discovered that if their gun was next to a village we would not retaliate because of the ROE concerning collateral damage. So they always placed their gun next to residential buildings and genuinely tried to shoot down our aircraft all the time; and they were getting uncomfortably close. We realised that the only attack we could make with sufficient accuracy to meet the ROE but also with the likelihood of damage to the target was high angle strafe. We discovered that there were 3 US pilots who had been trained in strafe – all fighter school graduates – and got them together to plan the attack. That day our rogue gun crew did fire on our aircraft and got an unexpected response from us – high angle strafe. We only did it once because of the greater risk associated with the attack, but we only needed to do it once to create the deterrent effect we required.

THE REGT SQN COMMANDER²⁶

When 51 Sqn RAF Regt arrived back at its home, RAF Lossiemouth, in December 2002 after 4 months on OP RESINATE(SOUTH) we expected to have a year away from operations. No 51 Sqn RAF Regt was newly re-formed and manpower was 76 all-ranks prior to incremental funding allowing the manpower ceiling to reach 164 all-ranks. Like our sister 'Field' sqns of the RAF Regt, 51 Sqn was equipped as Land Rover-borne specialist infantry for ISTAR-based tasks and with the ability to react and hit any aggressors against our air assets in flight-strength. This all sounds very effective, but the reality was that the 76-man Sqn has limited utility as it was used to operating only at section (8-man) strength.

On Christmas Eve 2002 I found myself being briefed at RAF Honington on the Sqn's 'emergency' deployment to Kuwait and then Iraq in support of the Joint Helicopter Force. In order to give me a full-Sqn's-worth of manpower my two flights were augmented with two flights from 63 Sqn RAF Regt, otherwise known as the Queens Colour Squadron (QCS), based at RAF Uxbridge. In addition I would receive 15 Auxiliaries (10% of the total) to top up the Sqn strength. The Sqn was to be ready to deploy in short order, in fact the main body deployed in early March 2003. The challenge was to unite the two halves of the Sqn under my Sqn HQ, (whilst based 600 miles apart in the UK), and train to a standard to be able to operate in Iraq in support of the JHF. The JHF was not an organisation with which 51 Sqn RAF Regt had trained before and so I was unfamiliar with their SOPs. Equipment issues such as vehicles, weapons, night vision aids and communications had to be matched to the skills level of individuals. QCS had no vehicle fleet so our 40-odd Land Rovers and trailers had to be put on trains south for them. Range qualification shoots had to be undertaken in a variety of weapons systems – assuming that we could book the ranges at no-

²⁶ From Wg Cdr Beckley, OC 51 RAF Regt Sqn, Op TELIC.

notice. Not the ideal preparation for war!

Sitting on the border the night before the ground war started I could see the whole Sqn convoy laid out in the desert like pieces spread over the squares of a chessboard. The ammunition had been 'borrowed', in the main courtesy of our RAF Regt contacts at Ali Al Salem. Desert clothing had been re-allocated between the Sqn to ensure that everyone had at least one set of desert dpm clothing. Our NBC detectors had been shared out amongst other units but we had at least the correct NBC clothing. Ground Intelligence had been generic and lacked detail on our objective, the town of Safwan. We were to occupy a deserted landing ground (where the Iraqis surrendered to Schwarzkopf in 1991) just north of the Iraq/Kuwait border. I had made full use of TAC IMINT WG staff at Ali Al Salem who had been able to provide me with imagery of the exact route that we were to use across the border. My lead sections all had A4 binders of this imagery to help navigate the way. Indeed, throughout the next two months we had frequent assistance from TAC IMINT WG, eg for our occupation of Basra airport, the images allowed us to see with our eyes what awaited us and allowed us to make up airfield crash maps ready for defence operations. COM BRIT FOR told me on two occasions that he was appalled that the Army could not get imagery from air assets. More 'agility' somewhere in the chain was necessary but it paid to be 'air-aware'.

Our operations at Safwan were bread and butter to the RAF Regt. Working alongside the US Marines of the 272 Marine Wing Support Squadron and our own Tactical Supply Wing, I was able to coordinate the defence of the landing ground and ensured the protection of the US and RAF helicopters that passed through for Fuel and Ammunition. There was no doctrine, no TTPs and no coalition exercises to prepare us for this operation; I just applied common sense. The challenge was to overcome the efforts of the Saddam Fedayeen and Baath Party activists to whom the helicopters and fuel presented a high-profile target. The obstacles were presented by the lack of intelligence that I mentioned, (in the end we gathered our own local intel), the rapid roulement of British units assigned to oversee the Divisional Rear Area, in which we were located, the lack of a coordinated CIMIC effort in our area which annoyed the Iraqis, and the random humanitarian aid efforts largely sponsored by the Kuwaitis. Our defence of Safwan was proved by the 100% flying sortie success rate. Our co-ordination with Div Rear HQ, PWRR and the RMP gave us the linkages we needed with our neighbouring units. We won the hearts and minds of the local farmers and townspeople by using our medical and EOD assets to come to their aid. We co-ordinated detailed food and water re-supply around the airfield and ensured the safe delivery of water from British Forces tankers into Safwan town. The press we welcomed and escorted around Safwan and the farming communities.

Within short weeks of deployment the Sqn's flights had knitted together to form a capable sqn. Not fully capable by the book by any means, but good enough for purpose. Officers and NCOs used their initiative at every phase: procuring rations from the US Forces; section cdrs training their personnel in the evenings and at every vehicle halt; designing our own Vehicle Check Points to meet the threat; engineering personnel modifying vehicles to overcome the threat of cheese-wires designed to behead our sentries; a Sqn shop in Iraq selling supplies bought in Kuwait; a satellite dish to bring the TV news to the tents; generators which appeared from out-with the Services supply chain; the layout of the Sqn leaguer allowing the sections to live off of their Land Rovers and trailers in the open air; hygiene drills that were adhered to and minimised the casualties from diarrhoea and vomiting; a section cdr saving the lives of the two gunmen who fired on his patrol and who were then cut down by the fire from his section.

In the end it all worked. We kept the helicopters protected from the ground threat. It was messy; there were negligent discharges, overturned vehicles causing injury, and a vehicle got hit by a mine and the crew had to be rescued, (just like the training video). It was not the way we had planned to go to war. Yet no one on my Sqn died or suffered serious injury. The leadership qualities imbued in the officer and NCO cadre enabled the Sqn to take advantage of every opportunity in whatever situation. I like to think I was a flexible leader; I probably was not as flexible as I thought I was! The important message is for commanders at all levels to listen to and use the person with experience to undertake a task; in that way you make the most of your assets and encourage people to contribute to the mission.

A HARRIER MISSION COMMANDER²⁷

In 2003 I went to Iraq as an exec with 3 Sqn. The Air Tasking Order simply primed us for 'Non Traditional ISR' with a back-up of on-call CAS. There were no given targets or weapons we were simply asked to carry the 'best available'. The trips would last anything between 4 and 6 hrs.

On one mission, my third in theatre, we got airborne with instructions to go to an ISR mission in our area of responsibility. We tanked so as to be full of fuel for any contingency and almost immediately the AWACS²⁸ tasked us to go to An Najaf, which was outside our area of operations! [Across in the eastern part of Iraq] We had no maps for it and had not considered that part of the operation. On arrival at An Najaf we contacted a forward air controller who was somewhat upset. He was part of a small team of conventional American forces and they had just found a big weapons cache in the town. They had been trying to load some of the RPGs²⁹ onto the back of their Humvees when the local militia had arrived to stop them. The man gave us the standard forward air controller talk-on and finished with the non-standard comment "If you see anything in the town that isn't us, you can bomb it." We managed, after a couple of minutes negotiation, to persuade him to change his mind and proposed that we do a little 'air presence' to see if we could split up the bad guys and make them run away. Then we dropped down to low level and tactically 'air presenced' the town. This gave the Americans a little bit of breathing space to get on their Humvees and leg it.

By this stage we were out of fuel and so went back to the tanker hoping that we were going to be re-tasked back to scud-hunting. Just before we had completed the refuelling, we were tasked to support some troops [back in the original area of responsibility]. It was again CAS for troops in contact. We got our bombs away to help out those boys and returned to the tanker for a third time. Off the tanker we were tasked right to the edge of our area of responsibility where we are out of contact with our C2 so working pretty much on our own. We were also very tight for fuel. We got in contact with the ground forces, dropped another bomb and sorted things out before returning back to base. By that time my cockpit had been a pretty wicked place and I was in need of a break!

There was no pre-planning and only a few decisions were pre-empted on the ground. We simply had to get airborne with a map of Iraq and hope for the best. Every sortie involved self-assessment from the cockpit of positive identification of the target; in-cockpit application of the

²⁷ From Sqn Ldr Harvey Smyth's presentation to the RAF Leadership Conference 2005.

²⁸ Airborne Warning and Control System.

²⁹ Rocket Propelled Grenades.

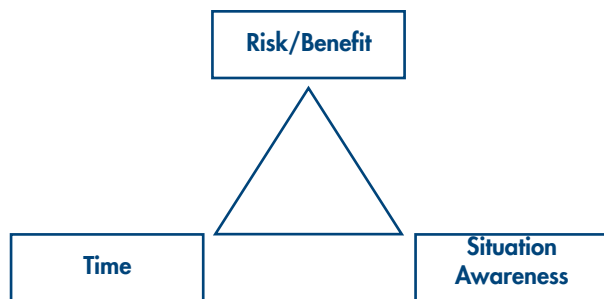
Law Of Armed Conflict (is this proportional, is this effect necessary?); in-cockpit evaluation of collateral damage and continuous self assessment of the Rules Of Engagement. All this happening in the cockpit whilst integrating with ground manoeuvring Forces, deconflicting from organic fires such as MLRS³⁰ and continuously avoiding the threat.

Cockpit leaders are now operating in a world where reducing the kill chain, or sensor to shooter time, can have strategic effect. To do this they are making more and more decisions in-cockpit, sometimes with a degree of calculated risk because of the ambiguity of the fog of war; decisions that in previous years, may have been made in a CAOC or some C2 building located away from the controlled chaos of the battle space.

THE COMMANDER WHOSE AGILITY WAS SEVERELY TESTED³¹

That we were likely to go to war in Iraq was on a limited distribution for several months before operation TELIC. This meant that I had to re-focus our pre-deployment activities, without making it obvious that Ops were imminent. In my MBA studies, case histories proved that communication was a common theme in taking people to places they might not otherwise choose to go – leading them. I had to lead them to a place that I could envisage but without telling them anything, indeed covering the truth with mistruths about ‘prudent preparation’ etc. This period of several months was certainly a time where my ability to be self-sufficient and robust as a leader were put to the test.

For Op TELIC all the Marham sqn cdrs had to deploy to Ali Al Salem which rendered C2 ad hoc at best. I had to adapt and make do with command arrangements which did not meet with my creative subconscious and this did cause me to be unsettled. It was right to suppress my inner thoughts on C2 as I considered the arrangements the best course of action and no threat to operational capability. Here I believe there are three dimensions to consider within a ‘triangle’ of variable pressures on the ‘agile airman’ that shape and pressurise his or her actions:



With pressure to act rapidly, there can be a propensity to act before sufficient Situational Awareness is available or without due consideration of the risk or benefit of ones actions. But as Situational Awareness builds over time the moment to make the optimum impact can be lost or the positive impact reduced. Every day in his or her career, the ‘agile airman’ balances the triangle of pressures to act decisively.

³¹ From OC 9 Sqn on Op TELIC.

During the combat phase of Op TELIC, my role became more focused on leading by example with time allocated to supporting my ground personnel who were working in difficult conditions. Under threat of SSM³² attacks and without adequate NBC protection.

When the No 2 in my formation, one of my crews, were killed, I remained on duty so that I could speak with the oncoming ground crew shift (who had seen the crew off) in order to allow them to explore their feelings and exorcise their grief. I partly suppressed my own emotional feelings which I believed to be in the best interests of leading through the episode. I was open-minded enough to realise that each individual affected by the event needed to react as they saw fit, but in terms of getting on with the job, I wanted to place a time pressure on them to do that and get back to doing the superbly professional job I required of them. I did not appreciate having to ask for the report into the incident 2 years after the event – I felt that it should have been made available to me immediately it was complete. I felt I was prevented by process from fully voicing my concerns over the fragility of our greatest asset – our people.

My personal experience and summation is that the features of the 'agile airman' are tangible but they can be affected by intangible means. In order to retain the malleability and balance between an automaton and a spirited leader who fully understands 'mission command', there is a need to nurture and protect, by way of appropriate recognition and reward (be they intrinsic or extrinsic). Without appropriate lubrication the 'agile airman' can become brittle.

A FG OFF SUPPLIER³³

In January 2001 the RAF, under the auspices of ISAF had restored the operating capability of Kabul international airport such that it was capable, not only of providing the only line of communication to support ISAF but, more crucially, providing a means by which aid could flow into Kabul. Equally, it was the means by which the ever-growing army of diplomats and officials could travel with reasonable speed and security. Not surprisingly the airport attracted the attention of those opposed to the interim national government and, throughout February and March of 2001, attempts were made to shell the airport using improvised mortars and rocket launchers. On the night of 30 April, the dissidents achieved their first success, dropping 107mm rocket rounds onto the operating apron and runway.

Whilst the post attack recovery process was underway, notification was received that two C130 aircraft were inbound, one requiring fuel as a matter of urgency, and one to offload RM Commandos. The arrival of these troops had been subject to a myriad of delays and pressure was mounting to complete their inload. Despite an expectation that the airfield may imminently come under further attack, the decision was taken to land both aircraft under total blackout for a rapid, engines running, refuel and unload – an unusual procedure fraught with its own difficulties. Once the aircraft were on the ground, speed was to be of the essence and Flying Officer Watson, the APOD Movements Officer, was responsible for co-ordinating the rapid refuelling and unloading of both aircraft. She quickly assembled her movements team in full fighting order and led them out onto the apron. Under her leadership the first aircraft was refuelled and dispatched in under thirty minutes without incident; she then prepared for the second aircraft which was following on quickly behind. The Royal Marines on the second aircraft were aware that the airfield had

³² Surface to surface missile.

³³ From Leadership: An Anthology, RAF Leadership Centre 2005, Vision and Decisiveness, Air Cdre Abbott.

just been under attack. Disorientated by an unfamiliar, pitch black airfield and the deafening roar of C130 engines, the Marines were in a vulnerable position. As the aircraft taxied in and the ramp dropped, Flying Officer Watson wasted no time in organising the Commandos and ensured their rapid disembarkation to a nearby shelter. Despite the risks involved, and urgency required, to dispatch the aircraft for its onward journey, Flying Officer Watson had the forethought and judgement to quickly organise the re-loading of two pallets on to the C130 so as not to waste the outbound sortie.

A WO FIREMAN³⁴

My section was responsible for providing fire cover at Kabul [Op FINGAL 2002], but a lot of our time was spent on non fire duties – force protection and guarding issues and so on. The setup at Kabul had a military area and a non-military side but the fire section was located next to the non-military activity. On the day in question a situation had been brewing throughout that day as no aircraft had taken off for the past few days and a crowd of people had gathered on the dispersal and were becoming very agitated. Late on in the day the Minister for Transport and his aide had been shown to an aircraft that was ready to depart and the crowd became very rowdy in response to this, firing into the air and shouting. They crowded round the aircraft, which already had its engines running, and then a few of them managed to break into it, attacking and killing the Minister for Transport and throwing his body in the back of a taxi. On seeing this, his aide and another man began running away across the dispersal pursued by the rioters. All this activity was taking place outside our area of responsibility and I had received orders in the build up of the situation that we were not to get involved but, as the events escalated and the crowd moved closer towards us, I saw that action was necessary.

I formed my manpower into a line and although we were only twelve people, we were of course armed, and so immediately looked quite threatening. At that stage in my mind we were purely acting as a deterrent and guard for our area of responsibility, but fairly quickly the two men who were fleeing from the crowd saw us and started running towards us. I had to make a decision then and there as to what to do and, in my mind it stopped being a decision based on areas of responsibility, and became a moral decision where people's lives were at stake. I shouted orders to move forward, by this stage there was only about fifty feet between the crowd and us but we managed to surround the two men and get them to safety. I think the sight of, albeit a small number, but a group nevertheless, of military well disciplined personnel advancing in a well ordered manner was enough to ensure the safety of the two men in danger. The situation had the potential to escalate further and become quite nasty but once we moved forward in a decisive way, shouting orders and making a stance we were lucky and they backed down.

A SGT ARMOURER³⁵

In terms of manpower, [5131(BD) Sqn] is around the size of the ground crew element of a Tornado Sqn; that is, about 105 men. Our traditional role has been tied closely to the main operating bases, as we are responsible for keeping airfields clear and operable. For that purpose we are equipped with armoured Spartan vehicles. Since the RAF Regiment lost their armoured capability a few years ago we are now the only armoured unit within the Royal Air Force. Although

³⁴ Ibid, Vision and Decisiveness, WO Andy Pittock.

³⁵ From Air Force Leadership: Beyond Command? Exposed Leadership! RAF Leadership Centre 2005.

I am trained as an armoured vehicle commander, it is a far cry from that of a tank commander.

About 2 weeks before we were due to enter Iraq from Kuwait we were attached to the 5th and 7th Regimental Combat Troops of the American Marines. Unfortunately there was very little time to train with these units, coming down, in the end to just a couple of days. We crossed the border with the American Marines at H+20 minutes and made straight for the Gas and Oil Separation Plants. ... As we approached the first installation, which was fiercely alight and shrouded by a thick, acrid, black smoke, we were surrounded by troops engaged in sporadic contact and to our west four helicopter gunships were battering an Iraqi convoy. [This was a] completely alien environment.

Shortly after this initial action we [myself, my Cpl and SAC and vehicle] were detached in support of 16 Air Assault Brigade as a small (3 man) BD team. ... [Now] completely on our own in terms of RAF Command ... we worked directly for an SO3 Royal Engineer who, although he did his best for us, was not in a position to give us the sort of command we would normally get from a Flight Commander or Troop Commander. The important thing to point out here is that during training build-up where we train to work on Deployed Operating Bases, we are always protected by support from the RAF Regiment, and as part of Joint Force EOD we were told that we would always have access to Force Protection. However, when we joined 16 Air Assault Brigade we realised that, being at the sharp edge of Army operations, we had suddenly become the Force itself. ... when I was working quite late one night. A Land Rover pulled up outside and took me to Brigade HQ where I was faced with a circle of people waiting eagerly for the Bomb Disposal Officer to arrive. As the Commander of my team that meant me. There was an Armoured Commander from the Royal Horse Artillery Armoured Screen; a Paratroops Commander who was ready to provide a blocking force; an American specialist decontamination unit; one of our own joint NBC Commanders; an in-theatre weapons intelligence person and my SO3. The Brigade Commander was apparently arriving 10 minutes later. Now, I was a bit confused by the expectant looks on their faces but apparently it is Army tradition that [this sort of] task is always Bomb Disposal led. So, at that moment everyone in the room was expecting me to put together the task. The Army Commander wanted to know where to push the armoured screen, the Paratrooper really wanted the blocking force in place and the intelligence people wanted to know how I was going to get the information back to them. This was quite a stirring moment because I had no idea what to do with an armoured screen, or how to carry out blocking. After a quick run down of what I needed to know I managed to find my way through a plan. It must have been sound because, despite the screen coming under fire, the task was carried out smoothly.

AN SAC MT DRIVER³⁶

I really enjoyed acting as packet commander [a small convoy of four or five vehicles]; once I knew the routes I was given more responsibility, which was good, because it was something, I'd never done before. We were also put in charge of the locally employed civilians and took them out in their own trucks on convoys and had to look after them. The language barrier at the Army camps meant you had to take them and feed them and make sure you had them all coming back and that was really good. Because we had Army escorts as well, we used to take the convoys to the borders and to Kuwait, we had to unload them and load them back up again to come back on

³⁶ From Leadership: An Anthology, To Be a Leader, RAF Leadership Centre 2005.

our own, so it was excellent responsibility to do that and I'm just an SAC.

The most difficult incident I had to deal with was when we had civilians with us and we were going into Basra, led by an Army Captain whose map reading skills were a bit sketchy; we ended up going in towards a hostile village and of course all the civilians started to panic because they didn't have any weapons. We ended up down in a ravine going the wrong way up the road. That was quite unnerving but it was our responsibility as packet commanders to make sure the civilians were alright in their cabs because they were all shouting and panicking. I never thought I'd be able to do that, but having been given the chance and proving to myself that I can do it, gave me a lot more confidence and I think it's given a lot of other lower ranks more confidence in themselves. It's made me think that anyone can be a good leader put in the right position, in the right situation and given a chance.

AGILITY – A HISTORICAL PERSPECTIVE

Mr Seb Cox

I think that one major problem that we face in trying to consider “agility” in a historical context is that, in terms of terminology and jargon it is a very recent addition to our lexicon. In times past, and not so recent past either, you would be hard pressed to find any RAF officer except a PEDO referring to agility as a positive requirement.

This historical consideration will therefore attempt to pick up on themes such as adaptability, robustness, flexibility, and responsiveness at the individual and organisational levels, together with organisational culture. So how does the RAF rate historically?

The story, as one might expect, is far from constant over time. At the very start of our story I think there are legitimate criticisms to be made. The very early development of air power in the UK was rather uneven. There were, I think several reasons for this. This stemmed in part from two factors, first the military conservatism of the British Army and Royal Navy at the time – both were somewhat hidebound institutions which were not particularly well adapted institutionally or organisationally to adopting new, indeed potentially revolutionary, technologies. Secondly, aeronautics at the time was very clearly an extremely dangerous pursuit, and was thus a young man’s game. A combination whereby knowledge and enthusiasm are concentrated at a junior rank level within a powerfully hierarchical and somewhat conservative organisation is not conducive to thoughtful and rapid progress. I think the early history of the RFC and RNAS, particularly pre-war, shows a number of relatively junior officers trying simultaneously to demonstrate the utility of a new technology within the framework of existing military roles, notably reconnaissance, to some rather sceptical seniors. At the same time these self-same junior officers were attempting to explore and extend the envelope of potential air power roles to direct attack etc. and to do so when neither the weapons, nor frankly the aircraft, were sufficiently capable. It is a difficult task simultaneously to both proselytise and maintain a rapid pace of development without exposing one’s flank to the sceptics all too ready to pour scorn on one’s efforts should they fall short in some respect or other.

The aviation pioneers also ran across influences other than scepticism which were far from benign. Thus, we find the early structure of the Royal Flying Corps, as originally proposed by the Standing Sub-Committee of the Committee of Imperial Defence was to be a model of jointery, intended to have a Naval Wing, a Military Wing and a unified Central Flying School¹, but is rapidly undermined by inter-service rivalry which destroys this structure and eventually sees the formation of a separate Royal Naval Air Service which goes its own way. Originally, the War Office had agreed that it held responsibility for the air defence of the UK, including London itself and important military sites such as RN dockyards, Woolwich Arsenal, munitions factories etc. As late as June 1914, just weeks before the outbreak of war, the War Office had no scheme for home defence but insisted that it remained their responsibility and that any available Naval aircraft should operate under Army control. At the same time War Office plans called for the despatch of all available squadrons to France on the outbreak of war, and when war came in August they duly decamped en masse over the horizon leaving just a few second line aircraft, none of which were armed with anything more lethal than the crew’s personal weapons. Whilst this was an impressive example of early expeditionary prowess it left the UK largely defenceless against the German Zeppelins, though fortunately the latter were no further advanced in their preparations for War.

Churchill, at the time First Lord of the Admiralty, bravely, though perhaps unwisely, accepted responsibility for home air defence on 3 September 1914, thus taking over a task which the War Office had insisted was solely its own just two months earlier. Churchill knew very well that he had potentially taken on a poisoned chalice, stating that the RNAS was “powerless” to prevent the death of civilians. He sought to pre-empt criticism by referring to “the obvious limits of our responsibility”². His principal motive for accepting the task was almost certainly a conviction that Naval bases and other important targets needed some protection, and since it was clear that the Army would not or could not do so he had allowed the latter to evade the consequences of their own pre-war obduracy.

Not all politicians would be willing to accept the risk of severe public criticism because they considered the policy adopted the correct one.

Much of the early disputes between the RFC and RNAS were concerned with attempts to obtain suitable aircraft and equipment. The early structure of the aviation arms had made this almost inevitable by failing to establish a proper bureaucratic structure for aircraft procurement when there was only a very narrow industrial base to support attempts at rapid expansion in both naval and military air arms. In struggling with the lack of a suitable industrial base in the UK, with engine supply in particular being largely dependent in the early years on French manufacturers, the two Services began to fight each other, and the early attempts at creating bodies to ameliorate or manage this largely failed (see below)³. As engine development was crucial to exploiting the full potentialities of air power this was a major problem. It also caused increasing inter-service tensions.

These tensions over supply quickly spilled over into the operational arena. The RNAS I think proved itself rather more innovative and agile than the RFC. The latter was slow to think of air power in terms of anything much more than reconnaissance, with occasional air attacks, usually on railway targets just behind the front. The RNAS however, showed early interest in strategic air attack. They attacked the Zeppelin sheds at Dusseldorf and Cologne in October 1914, destroying a Zeppelin in its shed. Later on they established a bombing Wing at Luxieul which, drawing on long naval tradition, addressed amongst other things the vexed problem of long distance navigation, as well as targeting and bomb-aiming⁴. The deeper penetration of enemy territory implicit in such operations brought the two Services into open conflict, since whichever of the RNAS or RFC was given the responsibility that service would have first call on the large aircraft with more powerful engines which were beginning to come into service. In addition, Sir Douglas Haig objected to the Luxieul Wing operating from France against Germany, i.e. conducting independent operations from within his theatre of operations. The Admiralty's Director of Air Services complained “It is the same story, the War Office want to stop our long distance bombing in order to get hold of our engines and machines ...”⁵. The Army got its way and the Wing was withdrawn. Meanwhile the Joint War Air Committee, a body with both RFC and RNAS representatives under Lord Derby, which had been established to oversee such questions, proved incapable of resolving the problems of allocation largely because the Admiralty proved unwilling to compromise. Eventually the JWAC broke up when Derby and the independent member Lord Montagu, resigned.

In essence, although the RNAS were undoubtedly the innovators at the operational level, their absolute intransigence in the JWAC destroyed the Committee and ultimately worked to their disadvantage. Almost precisely the same thing happened with the successor organisation, known as the Curzon Air Board. It was all very well being for the RNAS to be agile thinkers in operational terms, but their lack of adaptability in the Whitehall battlefield proved ultimately

counter-productive. Admiral Sir David, later Lord, Beatty, complained that the existing establishment of naval organisation “kills progress”⁶. So with the RNAS we have an operationally innovative Service which is less agile than it ought to have been because of organisational and cultural shortcomings, particularly with regard to the appointment of non-aviators to positions of influence within its supporting bureaucracy resulting in what one historian has termed the “recalcitrance ...of old sea dogs in high command”.⁷

The fossils at the Admiralty were ultimately outmanoeuvred by those officers, principally but not exclusively from the RFC, who saw that the potential of air power could only be fully exploited by a fully independent service. Principal amongst them was one General Sir David Henderson, of the great unsung heroes of British military aviation, and Lord Hugh Cecil, who had served at GHQ in France and believed fervently that air operations needed to be directed by people with an understanding of the environment in which they operated. Most people here, I hope and trust, will have heard of Field Marshal Smuts, and will know that it was his recommendations drawn up as a result of German air raids on the UK in 1917, which led directly to the formation of the RAF. In fact much of the visionary thinking contained in the Smuts Report was Henderson’s⁸. Much of the bureaucratic influence, however, stemmed from a belief that the production problems of previous years would be solved in 1918, and that a “surplus” of aircraft would be available for operations above and beyond those directed at supporting the maritime and military service forces. If that was so it made sense to concentrate and exploit the knowledgeable human resources in one organisation, namely an independent air service, rather than dispersing the knowledge around existing military organisation where it could not effectively influence and exploit the future available potential of air power. This all sounds very linear, with Luddites on one side, and visionary thinkers on the other. In fact, as always in life it was more complex. Thus Trenchard, though he recognised the capacity of the air arm for operations at strategic depth, was opposed to the creation of the RAF because he believed, correctly as it happens, that the war would be won or lost on the Western Front. Admiral Beatty, on the other hand, supported an independent air service, largely as we have seen because he believed naval bureaucracy was stifling the airmen. Despite its operational agility the RNAS actually contributed little to the debate on unification of the air services. As one historian has written “naval air administration was dominated not by officers of the like of Trenchard, Branker or Henderson, but rather by non-aviators, generally selected for their soundness than for any independence of thought”⁹. There may be a warning there – if you go for soundness you may sideline your agile thinkers. That the likes of Admiral Mark Kerr were agile thinkers is without doubt, that they lacked **real** influence in the Admiralty is equally obvious. A hostile organisational culture and lack of responsiveness and adaptability within the Admiralty undermined its own innovative thinking.

We should not, however, imagine that this was limited to the Admiralty. There are some fascinating cross-currents and whirlpools in the early thinking of the RAF. Trenchard, as we have seen, was opposed to the new service but ends up as its first CAS, though he falls out with his minister and resigns. He is persuaded back into the fold by a new minister, and ironically ends up commanding the Independent bombing force which was formed as the result of the Smuts report to undertake strategic operations against Germany. He agrees to this command only on condition that he reports directly to the Minister, Lord Weir, and not to the new CAS, Sir Frederick Sykes. He and Sykes had been at loggerheads with each other since 1914. Interestingly, however, this also ensures that his conduct of operations is subject to no outside scrutiny or influence. The downside of this, though I doubt it troubled Trenchard one jot, was that the deepest, most agile

if you will, thinker in the RAF on the strategic use of air power was one Major Tiverton, later the Earl of Halsbury, and he was back in London where his influence on operations was minimal. Tiverton was in many ways the forerunner of today's operations analysts. He set out to analyse air operations as scientifically as possible, both in terms of the effects of individual raids, and in terms of possible targeting of vulnerable sectors of an enemy economy etc¹⁰. He was way ahead of his time, but there was little prospect of Trenchard accepting any advice, never mind control from Whitehall.

This problem, of course, resurfaces in spades in the Second World War, when a myriad of economists, scientists, and Monday morning quarterbacks believe that they know exactly how the C-in-C Bomber Command should run his campaign. Sir Arthur Harris gets a bad press, but I have to say that when you see some of the suggestions that were pressed on him by supposedly knowledgeable officers in the Directorate of Bomber Operations in the Air Ministry you understand why he got so irritated¹¹. By and large, and because of its capacity to attack a number of different and widely dispersed targets simultaneously or sequentially, it is only with air power that you get major and continuous disputes over its application involving not just airmen, but also senior officers of the other services and politicians. They all want a slice of the air power cake because they recognise the immense combat power it wields, but they all want it for their bit of the war or their pet scheme, usually without the slightest consideration for the opportunity cost of what they propose. Nowadays, it is also a subject for direct intervention on the part of the combat lawyers. The latter may, of course, make your lives more difficult in one way, but they may also save you from a prison cell in the Hague.

Interestingly, many of Tiverton's ideas on bombing were picked up by a US Air Services officer named Colonel Gorrell, who incorporated them more or less verbatim in his own paper on air operations which found its way back up the chain of command to the United States and was accepted as the basis for planning future US air power. It is to Tiverton via Gorrell that we can trace quite directly the ideas concerning selective and precise targeting of vulnerable elements of an enemy economy which were developed between the wars by the US Air Corps Tactical School at Maxwell Alabama¹². It was precisely these ideas which the US strategic bomber forces attempted to put into practice over Germany between 1942 and 1945. Ironically, of course, and partly because Trenchard, who did not believe in precise targeting, held sway in the RAF, the RAF was much more inclined to the view that more general targeting and moral effect were more important.

Yet Trenchard himself was no stranger to agile thinking. He understood very well that his first priority after WWI was not aircraft at all, but infrastructure and training. He believed that if he could get the right people and train them properly they would provide the cadre for any future expansion. His innovative thinking extended not simply to creating the necessary institutions, notably Cranwell, Halton and the Staff College, but also to attracting the right people to them. At that time secondary education beyond fourteen had to be paid for in many local authorities. At Halton Trenchard provided free ongoing education and skilled trade training to a large number of high quality boys from social classes who had no access to such education. Not only did this prove extremely attractive, but it provided sufficient numbers of really high quality well trained technical personnel to support the Service. Furthermore, the top three Halton cadets each year were offered free scholarships to Cranwell. At Cranwell, where fees were payable, Trenchard wanted the Treasury to finance full scholarships for fifteen per cent of the cadets, but the Treasury

would allow only five of these “King’s Cadetships” per annum. In similar vein Trenchard pioneered the concept of the short service commission¹³. Neither of the other two Services had anything comparable and their more traditional recruiting methods did not produce the same consistently high quality recruits, particularly in the junior ranks. Such schemes were not cheap, and to some extent he sacrificed the equipment budget to pay for it, but it most certainly paid off during the Second World War. This was truly innovative thinking on Trenchard’s part, but he had the drive, energy and adaptability to ensure that such schemes did not fall foul of financial or bureaucratic obstacles. In this respect history shows us that agility is not simply an operational or strategic concept, it applies to training and recruiting. Indeed, if we accept the idea that the individual is the key, then these areas are absolutely fundamental to the ability to be agile in the future. Whilst you cannot train people to be innovative you can very certainly discourage agile thinking, and historically some military organisations have been pretty good at doing that – blame cultures being one supremely effective method.

Trenchard could also be innovative in other ways. It was he who proposed to Churchill that the RAF would take on the task of defeating the Islamic insurgency which sprang up in what was then British Somaliland in 1919. The Army had famously proposed an expedition of several battalions at a cost, even in those days, of several million pounds. Trenchard offered to send a squadron of DH9s to do the job much more cheaply. He fulfilled his promise, completing the mission against Abdullah bin-Hussain’s [known as the Mad Mullah] insurrection at a cost of approximately £100,000. It was this operation which caught the imagination of the Secretary of State, Churchill, who incidentally had himself proposed a mission to Somaliland with three airships in 1914 during the Mullah’s previous insurrection. Whether Trenchard knew of Churchill’s proposal five years earlier we do not know, but the CAS surely knew that a proposal to use technology and innovation to solve an old problem, and at reduced cost, was bound to fire the mind of his Secretary of State. It was the success in Somaliland which enabled Trenchard to build the entire edifice of Air Control, particularly in Iraq, which then did so much to preserve the independence of the RAF in the face of the concerted hostility of the other two services in that post-war period.

If Air Control and struggles over the Service’s continued existence dominated the 1920s, the thirties were a time of wholesale expansion and preparation for war. Here again the RAF’s record is on the whole creditable, though at times an over-concentration on strategic bombing threatened to unbalance its contribution. It is therefore in part a paradox for a Service supposedly obsessed with strategic bombing to display its most innovative and striking example of agility in the creation of the UK air defence system, though it is true to say that it was a real understanding of what a strategic bomber force might inflict on the UK which inspired its creation. As those of you who have heard me lecture *ad nauseum* on the subject know, I consider this a truly remarkable achievement. To create the world’s first integrated air defence system based on radar and sophisticated telecommunications was truly indicative of the very sound foundations which Trenchard had laid for the Service in the previous decade. Radar and the aircraft and aircrews would not, of themselves, have won the Battle of Britain, it required a properly thought out command and control system to integrate them into the whole. That drew on a myriad of skills, not least those of a warrant officer, probably a product of Halton, who designed the interior functioning of the various operations rooms, which those of you who have been to surviving example at Uxbridge will appreciate was an ergonomic triumph. This integration of a brand new technology, and one not directly related to flying, into an operationally effective system, all within five years of the first “proving” experiment is one of the RAF’s, and indeed the Nation’s, most

remarkable achievements. It is too often portrayed as the triumph of one “agile” individual, Lord Dowding, in defiance of the “system”. Though Dowding’s interest and encouragement were vital, this simplistic viewpoint does a disservice to the many others involved, and indeed the system’s agility in accommodating it.

On the other hand the early war years of Bomber and Coastal Commands and tactical co-operation with the Army were far less happy. Bomber Command, and here Trenchard certainly merits criticism, was equipped with a doctrine but little else. Its equipment was not well suited to the task, and its understanding of so much in terms of the basic requirements needed to fulfil its intended role was wide of the mark. Leaving aside the aircraft, its navigation training and equipment was woeful, its bombs poor, and its bombing techniques, if we can call them such, simplistic in the extreme¹⁴. Once the technical shortcomings were addressed, then the operational matters could be dealt with in turn and through a combination of thoughtful but forceful, not to say bloody-minded, leadership, it eventually became a force of immense power.¹⁵ So powerful in fact, that the tendency I mentioned earlier whereby everybody thinks they know how best to wield the weapon came to the fore. By the end of the war Bomber Command had certainly demonstrated a capability for taking on a wide variety of targets in a wide variety of contexts and in the process probably proved itself more agile than its C-in-C found comfortable. This flexibility undoubtedly led to the occasional misuse of Bomber Command as a weapon, e.g. its over-use in a close support role for the British Army in North-West Europe, a role for which it was not designed and to which it was not generally well-suited. But what that also demonstrates is just how flexible and effective it had become by 1944. There is a regrettable tendency seriously to underestimate the sophistication of the operational art in place within Bomber Command by the end of the War. The Command’s capacity to hit and destroy a wide variety of target types using a variety of techniques and weapons is poorly understood not just by the public and the media, who see only acres of devastated cities, but also, sadly, by too many of today’s RAF officers who have not studied the campaign in the depth required to appreciate its complexity. For example, if you want to see an exemplar of tactical agility look at the deception measures put into effect to spoof the German night defences during the Dresden raid¹⁶.

In tactical air power the early years were just as depressing. Pre-war decisions, notably the Government’s reluctance to countenance any large scale military commitment to the Continent, together with financial parsimony and a reluctance to embrace co-operative roles too openly lest it jeopardise the Service’s independent status, led to poor support for Army operations in Norway, France, Greece etc. That said, however, I think the sensible and innovative doctrinal development which took place particularly under ‘Marty’ Coningham and Tedder in the Middle East, not only redressed that imbalance, but did so reasonably quickly. In this regard I think the RAF was far quicker in adapting to the realities of the war they faced than their Army counterparts. I believe it is fair to say that the RAF was able to meet the Germans on equal terms in North Africa far earlier in the Middle East War than the British Army. They also proved themselves I believe **more** mobile and innovative than their Army colleagues in that campaign. I will give you just one example, Coningham was prepared to send his fighter wings to forward airstrips in advance of the leading British Commonwealth spearheads and in behind the Germans as the latter fell back after Alamein, at a time when the Army still had an exaggerated respect for the *Wehrmacht* and was wary of pressing pursuit too closely¹⁷. Many of the command and control lessons revealed in that campaign and developed by Tedder and Coningham are still applicable today and are still not well understood, in my opinion, in some quarters.

Coastal Command really was the poor relation, and supplies of just about everything, from suitable aircraft to functioning bombs and depth charges, took an unconscionably long time to reach the frontline. Inter-service rivalry and the resulting stilted doctrine, combined with poor aircraft¹⁸ and equipment to render the Command's early struggles in war largely a study of the triumph of character over adversity. Nevertheless, tactically and technically Coastal also proved itself a formidable foe by the middle-years of the War, and it merits an equal claim with the Royal Navy in the defeat of the U-boat.

The area in which the RAF continued to struggle almost to the end of the War was in air transport. This has always rather puzzled me, given that the forging of air transport links across the Empire had featured so prominently in the Service's inter-war struggles. The occasional triumphs, such as the aerial evacuation of Kabul, were insufficient to overcome what I suspect was partly a prejudice against what was seen as a role for civilians, and thus viewed as principally the business of Imperial Airways and not the RAF, and partly a visceral reluctance to explore too deeply into roles which were principally conceived as auxiliary to the older Services¹⁹. Arthur Harris who commanded 45 Squadron, then flying Vickers Vernons, a primitive transport aircraft, in Iraq was a highly perceptive officer but himself was not without prejudice here. Although I would not criticise his attempts to extend the role of his transport aircraft by fitting bomb racks and sawing a hole in the nose to allow for primitive visual bomb-aiming, his description of his reasoning in converting his squadron's aircraft in this way is revealing. He wrote "It immediately struck me that here was potentially the most powerful part of the Air Force in Iraq, employed on virtually civil duties and **making no serious contribution to our military strength in that part of a very disturbed World**"²⁰. Lack of resources played a part too, but the deeper-seated reasons why the operations of, for example, the Vernons and Victorias in the Middle East were not more closely studied are surely revealed in Harris's comments²¹. Hence, the RAF gave almost no thought to the potential of military air transport, which proved an expensive mistake in the first part of the war, when the *Luftwaffe* proved themselves far more effective in the role, at least until *Reichsmarshal* Goering emasculated the German air transport force at Stalingrad²². Harris displayed admirable agility in one sense, in extending the capacity of his aircraft, but rigidity in another, in not expounding and expanding the existing role he inherited.

In the time available there has only been the opportunity here to scratch the surface of this subject in historical terms. Nevertheless, I hope it has given you some food for thought, not least in suggesting that bureaucratic and institutional factors play a large part, and also that, as Trenchard himself demonstrated, agile thinking extends way beyond the operational sphere.

- ¹ On the early structure see Sir Walter Raleigh *The War in the Air Vol I* (OUP, Oxford, 1922), pp.198-199; Malcolm Cooper *The Birth of Independent Air Power* (Allen & Unwin, London, 1986) pp.7-8; Capt S W Roskill (ed) *Documents Relating to The Naval Air Service* (Navy Records Society, London, 1969) pp33-37
- ² Cooper, *Op. Cit.*, p.14. W S Churchill, *The World Crisis 1911-1914*, (Thornton Butterworth, London, 1923) 312-13.
- ³ Cooper, *Op. Cit.*, pp.15-16.
- ⁴ Neville Jones, *The Origins of Strategic Bombing: A Study of the Development of British Air Strategic Thought and Practice up to 1918* (London, Kimber, 1973), *passim*.
- ⁵ Roskill (Ed), *Op. Cit.*, p.365, Minute by Rear Admiral Vaughn-Lee, 5 June 1916.
- ⁶ Cooper, *Op. Cit.*, p.101
- ⁷ *Ibid.*, and John Sweetman, *The Smuts Report of 1917: Merely Political Window Dressing?* in *Journal of Strategic Studies*, June 1981, p.161.
- ⁸ See especially Sweetman, *loc.cit.*
- ⁹ Cooper, *Op. Cit.*, p.101.
- ¹⁰ On Tiverton see Tami Davis Biddle, *Rhetoric and Reality in Air Warfare – the evolution of British and American Ideas about Strategic Bombing*, (Princeton University Press, Princeton and Oxford, 2002), pp.38-40.
- ¹¹ For examples of some of these suggestions, memorably termed “panaceas” by Harris, see Dr Noble Frankland’s comments quoted in Sebastian Cox’s Introduction to Sir Arthur Harris: *Despatch on War Operations* (Frank Cass, London, 1995) p.xix.
- ¹² On the Tiverton/Gorrell link see Biddle, *Op. Cit.*, pp.54-55. See also Sebastian Cox “Anglo-US Co-operation” in *Air Power Review*, Vol. 7 No. 4, pp.19-20. [The Article was printed under an erroneous partial title, which should properly have read Anglo-US Co-operation in the First World War]
- ¹³ See E B Haslam Cranwell, pp.23-25 and John James The Paladins, (MacDonald & Co, London, 1990) especially Chapters 6 & 8.
- ¹⁴ On the technical shortcomings see Biddle *Op. Cit.*, pp.122-123, and Sir Charles Webster and Noble Frankland *The Bombing Offensive Against Germany* (HMSO, London, 1961 4 Vols.), Vol I, *passim*.
- ¹⁵ On leadership in Bomber Command see Henry Probert, *Bomber Harris – his Life and Times*, (Greenhill, London, 2001), especially Chapter 10.
- ¹⁶ On the operational aspects of the Dresden raid see Sebastian Cox, *The Dresden Raids: Why and How*, in Paul Addison and Jeremy Crang (Eds), *Firestorm: the bombing of Dresden, 1945* (Pimlico, London, 2006).
- ¹⁷ Vincent Orange, Coningham, (Methuen, London, 1990), Chapter 9.
- ¹⁸ One wartime C-in-C wrote of Coastal Command being “accustomed to getting the ‘leavings’”. Sir Philip Joubert de la Ferte, *Brids and Fishes* (Hutchinson, London, 1960), p.130.
- ¹⁹ For insights into Imperial Airways see D C T Bennett, *Pathfinder* (Frederick Mueller, London, 1958)
- ²⁰ Probert, *op. cit.*, p.52. Emphasis added.
- ²¹ The later history of air transport is covered by the Air Historical Branch history of RAF Transport Command – Humphrey Wynn, *Forged in War: a History of Royal Air Force Transport Command 1943-1967* (HMSO, London, 1996), but sadly it has nothing to say about the inter-war period.
- ²² On the destruction of the Luftwaffe air transport force at Stalingrad see the excellent work by Joel Hayward, *Stopped at Stalingrad: The Luftwaffe and Hitler’s Defeat in the East 1942-1943*, (University Press of Kansas, Kansas, 1996), especially Chapters 8-10.

THE LUFTWAFFE'S AGILITY: AN ASSESSMENT OF RELEVANT CONCEPTS AND PRACTICES

Dr Joel Hayward¹

A study of the Royal Air Force's worthy aspiration to increase its agility would be incomplete without at least some analysis of the air force that seems to embody exactly that quality: the Luftwaffe of 1939 to 1945.

It is fashionable among modern warfighters to lavish praise on the Wehrmacht; the army, air force and navy of the Nazi state. Laudatory analysis of the Wehrmacht's operational art seems an inherent component of books and articles that attempt to explain the theory and practice of jointery, the manoeuvrist approach, and the expeditionary nature of today's armed conflict. Commenting harshly upon the fixation that modern western warfighters seem to have with the Germans, Daniel P. Bolger lamented that "Maneuverists have a bad case of what may be called, to borrow from a sister social science, 'Wehrmacht penis envy.'" These devotees, Bolger writes, "love the Panzers, the Stukas, and the Sturm und Drang with the enthusiasm of any twelve-year-old boy who has yet to learn about Kursk, Omaha Beach, or Operation Cobra, let alone Bergen Belsen."²

Yet the fashion is not without foundation or merit. The Wehrmacht worked for an unbalanced and cruel regime and its frequently weird strategies, but nonetheless excelled at war's operational level. It performed so marvellously at that level that it took the combined weight of the Soviet Union, the United States, the British Empire and others to end its existence. Modern warriors will indeed learn much from studying Wehrmacht warfighting.

This short study of Luftwaffe attributes and habits is unrelated to the fad. Even if no-one else bothered to study the Wehrmacht I would feel compelled to highlight its instructional value for modern air forces as they face unforeseen challenges in the ambiguous strategic environment left after the Cold War's end and the War on Terror's beginning.

"The Agile Air Force" is the overarching theme of this conference and its proceedings. "Agility" is a quality highly desired by those air officers and strategists who want to keep the RAF very efficient and effective as it serves Her Majesty's Government in both the pursuit of security and the conduct of an ethical foreign policy. According to British military doctrine, "agility" has four attributes: robustness, responsiveness, flexibility and adaptability.³

While I agree with this doctrinal definition, I see agility as something more fluid and intangible than its four dry descriptors suggest.

Agility is an organic quality; the ability of a living thing to move swiftly, seamlessly and skilfully through various complicated and sometimes dissimilar motions. It might seem as though I am describing a decathlete; someone who competes in ten running, jumping and throwing events to

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² Daniel P. Bolger, "Maneuver Warfare Reconsidered," in Richard D. Hooker, Jr., *Maneuver Warfare: An Anthology* (Novato, CA: Presidio, 1993), p. 27.

³ Jt HLOC, Capping Paper, para. 2, as articulated in Future Air and Space Operational Concept, p. 2.

prove himself the best all-round athlete. It is certainly true that the decathlete is agile according to the doctrinal description: he is responsive, robust, flexible and adaptable.

Yet an even more accurately analogous activity might be the “tumbling” of a gymnast. Throwing himself through a long, tortuously difficult and variously paced set of somersaults, twists, rolls and other contortions the gymnast’s greatest challenge is to use the momentum and kinetic energy generated to carry him through the routine whilst constantly and instantly repositioning his centre of gravity so that he doesn’t unbalance, trip and sprawl headlong. That is true agility.

Using the four attributes of agility ascribed in doctrine as a loose framework, I will analyse the Luftwaffe’s agility in order to determine the nature and scope of that almost organic quality. I will try to shed at least a little light on the Luftwaffe’s unusual ability to throw itself rapidly in and out of distinct activities in all phases and at all levels of war, to maintain very high tempo, and yet somehow to keep its balance.

Robustness

When Hermann Göring assumed command of the brand-new Luftwaffe in 1935 he and his senior commanders immediately commenced developing it into a physically resilient force with men and machines capable of enduring long periods of high stress in a variety of environments. Rather than choosing to create separate, essentially mono-functional commands as the Royal Air Force did in 1936⁴, the Luftwaffe formed huge self-contained, multi-functional operational commands called Luftflotten (Air Fleets).

Each Luftflotte comprised all types of air combat units (reconnaissance, transport, fighter, ground-attack, dive-bomber, and bomber) as well as ground-based signals and flak units. The transfer of the latter from the Army to the Luftwaffe, in order to protect airfields and to aid in the air superiority battle, greatly strengthened the physical toughness of each Luftflotte⁵. This mutually supporting integration of aircraft and anti-aircraft artillery was years ahead of its time.

A Luftflotte was immense, growing throughout WWII to become the air equivalent of an entire German army group. It was nonetheless capable of being deployed in full to any European and Mediterranean theatre of operations, where it would partner an army group. Or it could be deployed in subordinate, army-sized commands called Fliegerkorps (Air Corps). Each Fliegerkorps was itself a smaller version of its parent; self-contained and fully multi-functional, capable of undertaking — either sequentially or simultaneously, cooperatively or independently — virtually the entire range of air missions from air superiority to reconnaissance, close air support, interdiction and independent bombing. Fliegerkorps were, in that sense, not entirely dissimilar to the Expeditionary Air Wings that the RAF is currently creating.

Each Luftflotte possessed one or more partnering Luftgau (Air District). These Luftgaue were administrative organisations designed to manage the fleet’s principal training, procurement, supply, repair and maintenance affairs, as well as the creation and upkeep of fuel depots, main

⁴ With Fighter Command, Bomber Command, Coastal Command, Training Command and later Ferry (finally renamed as Transport) Command.

⁵ The best treatment of the integration of flak artillery into the Luftwaffe is still Horst-Adalbert Koch, *Flak: Die Geschichte der deutschen Flakartillerie, 1935-1945* (Bad Nauheim: Podzun, 1954).

operating bases and deployed airfields. Without direct daily responsibility for those time-intensive administrative matters the operational commanders were able to concentrate far more exclusively on their key task: defeating the enemy in battle⁶.

During wartime the Luftgau served as the logistical lifeline between the Reich and the various highly mobile in-theatre Luftflotten and Fliegerkorps, which were sometimes fighting over one thousand miles outside the Reich's pre-war borders. Up until inexorable Soviet victories began to crush the Wehrmacht in 1944 the system worked well. During periods of fluid combat and fast manoeuvre the Luftgau worked under great pressure, but generally managed to keep air units repaired, maintained and operating from often hastily constructed airfields right behind the Army's forward lines at what was, by WWII standards, an extraordinary daily sortie rate.

The ability of the Luftgau hastily to create adequately functioning airfields on rough strips of pasture or steppe, for instance, allowed various widely separated Fliegerkorps to loan whole wings to each other at relatively short notice when opportunities or crises emerged. During three days in mid-May 1942, for instance, Luftflotte 4 frenetically transferred over 360 fighters, dive-bombers and bombers 300 miles north from the Crimea to the Kharkov region to blunt an unexpected massive Soviet offensive⁷.

Aircraft flew into airfields that had been hurriedly transformed from empty steppes and rough crop fields. Thanks to the exhausting work of highly mobile Luftgau "special staffs",⁸ and associated air, army and Reich Labour Service battalions, they were each able to fly up to eight combat sorties per day throughout the rest of May.⁹ They had a huge impact.

A relieved Generaloberst (Colonel-General) Franz Halder, Chief of the Army General Staff, noted in his diary that the force of the Soviet attack had apparently "been broken by the efforts of our Luftwaffe."¹⁰

Responsiveness

Although both doctrine and wartime necessity tied the Luftwaffe to army cooperation to a greater degree than that experienced by the RAF and the USAAF, the Luftwaffe generally proved both sensitive to minor fluctuations within and around the battle-space and able to react quickly when opportunities or crises emerged. Even during the pre-war years the Luftwaffe emphasised, and validated during war games, the importance of keeping the optimal ratio of specialised short and medium-range reconnaissance aircraft at more than ten per cent of all combat types¹¹. During the first three and a half years of war, in particular, the Luftwaffe possessed proportionately far more reconnaissance aircraft than did the Red Air Force, its greatest foe, and RAF tactical commands. When Barbarossa started on 22 June 1941 reconnaissance aircraft composed eighteen per cent of the Luftwaffe's total fleet.¹²

⁶ Karl-Heinz Völker, "Daten zur Gliederung und Organization der Luftwaffe," Wehrwissenschaftliche Rundschau, 4, April 1967, pp. 113-114; Joel Hayward, *Stopped at Stalingrad: The Luftwaffe and Hitler's Defeat in the East, 1942-1943* (Lawrence, KS: University Press of Kansas, 1998, 2001 ed.), pp. xi-xii.

⁷ Bundesarchiv-Militärarchiv [hereafter: BA-MA] N671/9: Dr. Wolfram Frhr. von Richthofen, Generalfeldmarschall. Persönliches Kriegstagebuch [hereafter: Richthofen TB]: Band 9: 1.1.-31.12.1942, entry for 12 May 1942.

⁸ Luftgaustäbe zur besonderer Verwendung.

⁹ Joel Hayward, "The German Use of Airpower at Kharkov, May 1942," *Air Power History*, Vol. 44, No. 2 (Summer 1997), pp. 18-29.

¹⁰ Franz Halder, *Kriegstagebuch: Tägliche Aufzeichnungen des Chefs des Generalstabes des Heeres, 1939 - 1942* (Stuttgart: Kohlhammer, 1965), Volume 3, p. 442.

¹¹ For a basic breakdown of the Luftwaffe's composition, strength and serviceability rates in all theatres throughout the war see Williamson Murray's classic, *Strategy for Defeat: The Luftwaffe, 1933-1945* (Maxwell AFB: Air University Press, 1983). For a thorough assessment of the Luftwaffe's composition, strength and serviceability rates in Russia see 'Stopped at Stalingrad'.

¹² BA-MA RL 2 III/713: Vortrag über die Einsatzbereitschaft der fliegenden Verbände, Stand: 21.6.1941, GenSt. Gen.Qu. 6.Abt. (I) vom 24.6.1941.

Under Luftwaffe command but assigned to army formations and their tactical control¹³, short-range reconnaissance units routinely provided the Army with a pleasing quantity and quality of information in a highly timely fashion, thus enhancing the operational tempo and flexibility of both services.

After the Battle of Kharkov in May 1942, for example, Generaloberst Ewald von Kleist, GOC of the First Panzer Army, profusely praised Fliegerkorps IV's "tireless" reconnaissance fliers, who gave him "a clear picture of the enemy at all times" and allowed him to operate with notable dexterity.¹⁴

Moreover, because medium-range reconnaissance units (mainly flying Do17s) remained under Luftwaffe command, and were bound less tightly to army units than their short-range brethren, they were free to roam far behind the battlefield without too many army accusations that they were not doing "their job". Some covered truly long distances. To maximise the reach and survivability of dangerous long-range observation and photographic reconnaissance missions, the Luftwaffe operated numerous squadrons of permanently converted bombers, including Ju88s and He111s. It even often sent regular bombers in routine squadron service out on reconnaissance missions when brief pauses in operational activity permitted.¹⁵

In order to ease and speed the gathering, interpretation and dissemination of information the Luftwaffe developed a decentralised network of highly mobile photo labs, radio interception units, intelligence cells and telephone and wireless signals teams spread out across many airfields in each Fliegerkorps operational area. Flexibility was the buzz-word. The system had to be immediately responsive. Delays were not tolerated. After the war the US War Department observed that, in order to keep this system highly effective, the Luftwaffe expanded its signals service proportionately throughout the war more than any other arm or element.¹⁶ At least during the first four years this resulted in impressive flexibility.

Intelligence assessments went immediately and directly to local combat squadron and wing commanders (as well as to higher authorities, of course) so that they could respond immediately as tactical circumstances demanded and opportunities emerged without having to wait for intelligence, guidance and orders to filter down through the chain of command.

This pattern appears to reinforce a common perception among today's manoeuvrists that German army, air and naval commanders habitually employed the highly decentralised, tempo-enhancing command concept known as *Auftragstaktik*, or "mission command".¹⁷ According to this concept:

- The commander should trust his well-trained subordinates to respond to changing circumstances responsibly, creatively and with initiative in his absence because of the subordinates' far more intimate and immediate situational awareness.

¹³ United States Air Force Historical Research Agency [USAFHRA] 512.625-3: Br. Air Intelligence, A.I.3.E., Army Cooperation in the GAF: The Duties and Responsibilities of Reconnaissance Units, 29.7.43.

¹⁴ BA-MA RL 10/473a: Generalkommando des IV. Fliegerkorps, Adj. IIa., Gefechtsstand, I. Juni 1942, gez. von Kleist.

¹⁵ Cf. BA-MA RL 8/86: Fliegerführer Süd, Tageseinsatz-Meldungen, 24 February 1942.

¹⁶ U.S. War Department Technical Manual TM-E 30-45 I: Handbook on German Military Forces, 15 March 1945, p. X-II.

¹⁷ Explanations of *Auftragstaktik* (lit. "task-tactics") are now common in works on manoeuvre warfare, but a reliable place to start is still Robert Leonhard, *The Art of Maneuver: Maneuver-Warfare Theory and AirLand Battle* (New York: Presidio, 1991), pp. 113-116.

- To ensure that the subordinates' decisions and actions conform to overall objectives, the commander should ensure that they always know what results he intends (usually defined as the condition or position he wanted the enemy to be in after the engagement).
- Orders at all levels should be short, simple, easily understood and non-prescriptive.

We should not exaggerate the degree to which the German military habitually employed *Auftragstaktik*. Even during the successful campaigns of 1939 to 1942 only a minority of Wehrmacht officers understood, liked, or (as the quality of staff training decreased during wartime) were adequately taught to practice the concept effectively. Then, as overwhelming enemy strength began to crush the Wehrmacht after 1943, creative offensive actions petered out, thereafter replaced by reactive defensive operations.

Yet, like the German Army, the Luftwaffe did decentralise operational and tactical command relationships, and permit the spontaneous, initiative-driven seizure of opportunities, to a greater degree than its Soviet, American and British counterparts. Decision-making generally occurred at the lowest possible level in the command chain, and even the Luftwaffe Operations Staff directed in May 1941 that it might often be necessary to by-pass various levels in order to maintain tempo and initiative.¹⁸ Colonel Robert Pötter, a bomber commander in Russia, summarised his experience of effective *Auftragstaktik* within the Luftwaffe: "We were told what we had to do, but not how to do it."¹⁹

This command style enhanced both responsiveness and flexibility, at least in the years before war-weariness set in. In 1945 the U.S. War Department expressed grudging praise that "German tactical doctrines stress the responsibility and the initiative of subordinates."²⁰ A mistaken belief that the German forces "were inflexible and lacking in initiative has been completely destroyed in this war, in which aggressive and daring leadership has been responsible for many bold decisions." While it mentioned the German Army especially, the War Department's assessment equally applied to the Luftwaffe, which was unsurprising in light of the fact that the battle-space integration of the Army and the Luftwaffe, at all levels (in minor engagements, large battles and vast campaigns) exceeded most Allied efforts. For example, army regiments and divisions and local Luftwaffe wing-sized commands often swapped reconnaissance information and other intelligence directly. Without much (if any) involvement from their parent divisional, corps and Fliegerkorps headquarters, they sometimes closely coordinated their almost-spontaneous, collaborative exploitation of emergent opportunities or response to threats or crises.

This practice had the potential to create innumerable small and unconnected air efforts, with individual units fighting their own battles without much coordination. Such a situation would obviously have dissipated the enormous effect that air power can generate when concentrated.²¹ Yet this seldom happened. Fliegerkorps and Luftdivision commanders may not have initiated all operations, but they and their staffs attentively monitored them as the information flow permitted and, when necessary, coordinated or reshaped them to create the desired focus and effect.

¹⁸ BA-MA RH 27-18/4: Oberbefehlshaber der Luftwaffe Führungsstab, Ia 1440/41 geheim, Taktisches Merkblatt für die Führung von Nahkampferbänden, 8.5.41.

¹⁹ Lonnie Ratley, "A Lesson of History: The Luftwaffe and Barbarossa," *Air University Review*, Vol. 34, No. 3 (March-April 1983), p. 57.

²⁰ U.S. War Department Technical Manual TM-E 30-451: Handbook on German Military Forces, 15 March 1945, p. IV-1.

²¹ For a Luftwaffe Generalmajor's discussion of this potential weakness, see: US Department of the Army MS #B791a: "The Collaboration between the Army and the Luftwaffe: Support of the Army by the Luftwaffe on the Battlefield." Translation by Charles E. Weber of the PW Report of General Karl Heinrich Schulz, 12 December 1947.

The Luftwaffe always took pride in its responsiveness, especially when joint operations were involved. It did not want — and seldom got — accusations that it failed to cooperate in a timely fashion or with appropriate actions at the desired place. Generalfeldmarschall Albert Kesselring was so determined that his partnering army in Russia would get full and timely support that he told his Luftflotte 2 staff and commanders that they were to consider the Army's wishes as orders issued by him.²² Kesselring's desire to provide full and timely cooperation was not unusual. Common practice based on doctrine — including the keystone *Conduct of the Air War* published in 1935²³ — ensured that, alongside the prosecution of some independent air missions, the Luftwaffe and the Army worked together rather well. In close consultation on a daily basis, ideally from co-located headquarters,²⁴ operational commanders and their staffs from both services ironed out minor conceptual differences, meticulously coordinated the integration of their forces and identified joint *Schwerpunkte* (lit. “heavy points”).

To create these focal points they carefully chose the geographical position in each theatre or sector that they jointly considered to be the optimal place to unbalance the enemy force's centre of gravity through synchronised attack.

Variations of this practice existed within the Soviet and other Allied forces, of course, and the RAF's Tactical Air Forces of the war's final two years spring quickly to mind. Yet the Germans were unusually flexible in the way they scrutinised and amended their *Schwerpunkte* repeatedly each day during periods of high tempo or unusual fluidity. During the June 1942 Battle of Sevastopol, for instance, Field Marshal Erich von Manstein, GOC Eleventh Army, and Generaloberst Wolfram Freiherr von Richthofen, GOC Fliegerkorps VIII, oversaw their joint battle in total harmony and usually from shared command posts. With intelligence gained mainly by Richthofen's air reconnaissance squadrons, they constantly switched their *Schwerpunkt* from place to place as the battle ebbed and flowed. Their *Schwerpunkt* on 3 June was the defensive line facing the 30th Army Corps south of Sevastopol, on 4 June the line facing the Rumanians in the east, and on 5 June that facing the 54th Army Corps in the north. On 6 June it was again the line facing the 30th Army Corps.²⁵

Flexibility

At the tactical and operational levels the Luftwaffe routinely demonstrated acceptable, and sometimes excellent, flexibility when it encountered unexpected or heavy stresses that might have confounded or broken more rigid air forces. At the heart of its warfighting flexibility lay a spirit of “ad hocery,” a perception among Luftflotte and Fliegerkorps commanders that, when particular needs demanded, they could fragment, transform and reassemble their command structures as they saw fit without having to argue a case to do so with the Luftwaffe's strategic-level authority, the Oberkommando der Luftwaffe (High Command of the Luftwaffe).

Particularly during tough defensive battles it was not uncommon for a Fliegerkorps or Luftdivision commander to select a skilled, tough and trusted lieutenant-colonel or colonel and

²² Horst Boog, *Die deutsche Luftwaffenführung, 1935-1945: Führungsprobleme, Spitzengliederung, Generalstabsausbildung* (Stuttgart, Deutsche Verlags-Anstalt, 1982), p. 196.

²³ Luftwaffe Dienstvorschrift 16: *Die Luftkriegführung* (Berlin, 1935). The best, although not complete, translation of this important document is provided in James S. Corum and Richard R. Muller, *The Luftwaffe's Way of War: German Air Force Doctrine 1911-1945* (Baltimore: Nautical and Aviation, 1998), pp. 118-157.

²⁴ BA-MA RH 27-18/4: Oberbefehlshaber der Luftwaffe Führungsstab, Ia 1440/41 geheim, *Taktisches Merkblatt für die Führung von Nahkampfverbänden*, 8.5.41.

²⁵ BA-MA N671/9: Richthofen TB: Band 9, entries for 3-7 June 1942.

have him create a new air combat group with the sole task of blunting an enemy advance or regaining the initiative. Often named after that “heroic” officer to enhance its focus, cohesion and élan; the makeshift formation would get its own airfields, supporting infrastructure and logistics networks. It would fight furiously until its mission at the new Schwerpunkt ended, perhaps in a week or a month, whereupon its component squadrons would return to their original wings, or be reassembled into another ad-hoc formation.²⁶

Sometimes these ad-hoc formations were vast and hardly of a minor tactical nature. For example, when it became clear to Richthofen on 25 January 1943 that elements of the retreating German Seventeenth Army faced encirclement in the Taman Peninsula, he ordered Generalleutnant (Lieutenant General) Martin Fiebig, GOC Fliegerkorps VIII, to throw together a huge temporary airlift command to protect and supply that army while it evacuated it, bit by bit, back to the Crimea.²⁷ True to form, Fiebig worked feverishly to create this new command. He ordered Luftgau administrators, pioneer battalions and signals teams to create and equip new airfields and expand existing ones. He began skilfully plucking reconnaissance, fighter, bomber and transport squadrons from various wings throughout Fliegerkorps VIII's vast theatre — thinning those wings by one squadron each — and assembling brand-new wings and groups from them. Within days he created a full command, Lufttransporteinsatz Krim (Air Transport Mission Crimea), which immediately began its main missions, protected by its own fighters. It proved highly effective, evacuating no fewer than 50,000 German troops within a month and carrying a daily average of 500 tons of fuel, ammunition and rations across to those who remained. On some days the ad-hoc command evacuated 5,000 men and carried across 700 tons of supplies.²⁸

All the examples of Luftwaffe flexibility presented here relate to the joint battle-space involving both the Army and the Luftwaffe. That is understandable. Joint warfighting was the Luftwaffe's bread and butter. Critics might argue, therefore, that the Luftwaffe was ever only as flexible as the army it partnered, and was not *independently* flexible. That is a fair criticism, as far as it goes. Yet it ignores the fact that the Luftwaffe understood its role very well, and although its operational commanders occasionally fumed about the lack of independent missions — army-friendly Richthofen himself once hissed that the Luftwaffe was “the Army's whore”²⁹ — they applied an incontestable logic: to enhance *their own* flexibility they needed to enhance *the Army's* flexibility. They applied this logic with commendable commitment, and raised the flexibility of the joint effort as a result.

Adaptability

In its preferred environment of joint air-land warfighting the Luftwaffe demonstrated significant flexibility, as shown above, and it continued to do so in that environment and others until it permanently lost the one overriding condition that had always permitted it: air superiority. The Luftwaffe lost this in Italy in August 1943, in the West and above the Reich several months before D-Day, and in the East several months thereafter.

²⁶ Cf. *ibid.*, entry for 2 January 1943; USAFHRA 168.7158-335: Gruppe Stahel, Gef. Qu., den 20.12.1942, Bericht über den Zustand der Truppe am 20.12.1942.

²⁷ USAFHRA 168.7158-335: Tagebuch Generalleutnant Fiebig, 25.11.1942-2.2.1943, Fiebig TB, entry for 25 January 1943.

²⁸ BA-MA N671/10: Richthofen TB: Band 10, entries for 9 and 28 February and 11, 12 and 14 March 1943; BA-MA RL 8/59: Lufttransporte VIII. Fliegerkorps, Januar und Februar 1943.

²⁹ USAFHRA 519.619-7 14 August 1945: HQ US Strategic Air Forces in Europe (Rear) Office of the Historian, AAF Sta 390, APO 413, US Army, Questionnaire on GAF Doctrine and Policy: Answers by Gen. Maj. von Rohden (PW) and Col. Kriesche (PW) to Questions Submitted by Major Engelman.

Agility routinely enhanced Luftwaffe performance, but it could not do much in what became a non-winnable war of attrition in the air. No amount of agility could prevent the loss of air superiority or negate the disastrous consequences of that loss. During its prodigious struggle to adjust and respond to the constantly changing and ever worsening Combined Bomber Offensive, the Luftwaffe in the West tried almost everything and virtually recreated itself by adapting old methods and equipment when it could, and adopting entirely new ones when it could not. It vastly expanded and improved its integrated air defence network of Freya (and later Würzburg) radar stations, ground control intercept stations, spotlights, flak batteries, radar-equipped night-fighters and super-fast day fighters. To coordinate the Reich's air defence battle the Luftwaffe created a new air fleet, Luftflotte Reich — its first mono-causal, mono-functional air fleet — in February 1944. The Luftwaffe also ceaselessly experimented with, introduced and refined a range of improved aircraft, new armaments and bolder and more imaginative tactics.³⁰ But this time the Luftwaffe was fighting a foe that, because of its virtually unlimited resources, great resolve, high morale and equally marvellous adaptability, it could neither outnumber nor outclass.

The fact that the United States produced four-fifths as many planes in 1944 alone as Germany had throughout the entire previous five years was bad enough³¹ (and Britain and the Soviet Union also had large production rates), but the intractable offensive-mindedness of Wehrmacht and Luftwaffe air power thinking worsened the situation considerably. Even when the rapid manufacture of fighters for defensive counter-air battles above the Reich became a desperate priority during 1943 and 1944, German factories continued to churn out thousands of bombers (which took far more raw materials and factory floor space) for offensive joint battles around the Reich's shrinking perimeters, particularly in the east.³²

These production figures should not disguise what lay at the crux of the attritional air war, which was not Germany's ability to produce sufficient airframes, but something that agility could never address: the Reich's impossibility of training pilots and aircrews to a competitive level in sufficient quantities.

At the beginning of the war the Luftwaffe's pilots had spent slightly more time in basic and operational training than their RAF counterparts.

When war bogged down in 1943 and acute fuel and air combat attrition began to bite, the Luftwaffe's training programme attempted to adapt by compressing and streamlining courses and paring down tuition in all non-essential skills, but still could not meet the Luftwaffe's output demands. By the time of D-Day it gave its new pilots barely half the basic training hours and only one-third the hours in operational aircraft that the RAF gave its own.

The USAAF's pilots received even more than the RAF's.³³ Luftwaffe fighter trainees, to highlight this disparity, received only 30 hours in operational training, RAF fighter trainees got around 80, and USAAF trainees got around 160 hours.³⁴ By mid-1944, when the Allied campaign was inflicting appalling attrition on Luftflotte 3 and Luftflotte Reich, the Luftwaffe had no choice but to man their fighters and bombers with fewer and fewer skilled pilots. It was an impossible situation.

³⁰ Luftwaffe efforts to adapt to its greatest challenge are strongly analysed in Richard R. Muller, "Losing Air Superiority: A Case Study from the Second World War," *Air & Space Power Journal*, Vol. 17, No. 4 (Winter 2003), pp. 55-66.

³¹ John H. Morrow, Jr., "The German Aircraft Industry in the First and Second World Wars: A Comparison", in Horst Boog, ed., *The Conduct of the Air War in the Second World War* (New York: Berg, 1988), p. 47.

³² National Archives and Records Administration, Microfilm T321/10/4746765: Luftwaffenführungsstab Ia/Flieg. Nr. 9592/44 g.Kdos. Chfs. (T), Studie über die Flugzeuglage der Kampfverbände, 5 May 1944.

³³ Williamson Murray, "Attrition and the Luftwaffe," *Air University Review*, March-April 1983, Vol. 34, No. 3, pp. 66-77.

³⁴ Murray, *Strategy for Defeat*, pp. 312, 314.

The Luftwaffe's loss of air superiority along most fronts by 1944 devastated the Wehrmacht's joint warfighting, which was based around "reconnaissance pull," one of the key ingredients in implementing Auftragstaktik and maintaining tempo. In the German system attacks tended to move in directions identified by forward air and ground units, not by commanders in the rear who might have felt tempted to push their forces forward along pre-selected routes. Reconnaissance units constantly watched the enemy and probed for undefended or lightly defended gaps in the enemy line that potentially led to the enemy rear. The whole force then, upon orders from forward commanders, followed the "pull" of the reconnaissance units and smashed through the gaps to achieve penetrations and hopefully a breakthrough.

Yet in the months following the Normandy landings, ferocious Allied air power robbed the Luftwaffe of its ability to function as "the Army's eyes".

Almost everything that the Luftwaffe put into the sky got shot down — except for the stunning and almost invulnerable Arado Ar 234 jet bomber-reconnaissance plane, very few of which existed.³⁵ Both the German Army and the decreasing number of Luftwaffe support forces became tactically and operationally blind, thus denying them any flexibility and useful ability to employ initiative.

The Luftwaffe reconnaissance units responded with characteristic adaptability, experimenting with new flight tactics and dispersal, camouflage and deception procedures, but nothing made much difference. Reconnaissance units could not fly, and ground-attack aircraft, also flying at great risk against overwhelming air strength, therefore accomplished very little.

The Luftwaffe itself reported that its ground-attack aircraft "no longer afforded any decisive support to the land forces, and the heavy losses incurred rose ultimately to a level out of all proportion to the successes achieved."³⁶

Conclusions

This short assessment focused only on aspects of the notable agility that the Luftwaffe revealed as it prosecuted warfare within the deficient conceptual framework that Nazi politicians and strategists, including airmen, created for their armed forces.

The paper demonstrated that the Luftwaffe commonly operated with what can only be described, by the norms of the period, as effective agility. During its years of gain and even into its years of loss the Luftwaffe constantly monitored the battle-space, quickly assimilated and acted on information, and flexibly applied force. It coped well with high-tempo operations, adapted quickly to changing circumstances and flexed without breaking under enormous stresses. It is beyond the scope of this paper to catalogue and critique the reasons for the Wehrmacht's eventual failure, or even to explain its lack of emphasis on independent "strategic" air campaigning and maritime aviation. It is sufficient to note only that, among the Wehrmacht's many weaknesses and failings, the Luftwaffe's agility could not be counted. That does not mean that agility, despite being a potent force multiplier, could rectify fatal strategic flaws. The Germans learned a hard lesson, one worth reflecting upon: that if a nation fights the wrong war against the wrong foe then its military agility will do nothing more than delay defeat.

³⁵ Alfred Price, *The Last Year of the Luftwaffe: May 1944 to May 1945* (London: Greenhill, 2001), pp. 63-65.

³⁶ USAFHRA 512.621 VII/14, 15: Generalstab 8. Abteilung, [Historical Office of the Luftwaffe General Staff] "Development of the German Ground Attack Arm and Principles Governing Its Operations up to the End of 1944," 1 December 1944.

General T. Michael Moseley

Chief of Staff of the United States Air Force

Thank you for a warm invitation, and thank you for the opportunity to share some thoughts. It's important for us to have an opportunity to think about the future of coalition air and space power, and what it means for our countries and the world when we talk about "agility." If you'll allow me today, that's what I want to talk about. I want to take the notion of agility and the notions that we've talked about in the area of national air and space power, and I want to tell you what we are trying to do in terms of some American Air Force-specific programs and initiatives.

Let me start with a brief reminder. It's no strange message to this group that 66 years ago today the Royal Air Force was a week and a half into the Battle of Britain. Today, 66 years ago, the RAF flew 655 sorties – with 224 serviceable Spitfires and 308 serviceable Hurricanes. That day the RAF downed nine confirmed enemy fighters, bombers and seaplanes, and claimed another 13 unconfirmed kills, while losing just five Hurricanes and one Spitfire.

Similar days followed in the subsequent months. I don't need to remind this audience of what it meant for the entire nation and arguably the entire industrialized world -- waiting and watching. The outcome at that time was not certain. Ultimately the Battle of Britain was to save a nation, arguably to save the world, turning the course of history. So what do we know from those experiences so we can apply it today? If you'll allow me to, that's what I want to talk about.

I want to talk about this world that we live in, that the other speakers before me have captured very eloquently...we are a world at war. It is an increasingly strange and challenging world that we live in when we deal with religious extremism, transnational criminal activity, transnational narcotic trafficking, human trafficking, very very violent activities...all threats to what we think in the civilized world, and how as we look at this the simultaneity of these events that occur. Plus we have humanitarian events - an earthquake, a mudslide, a tsunami, or in the case of my country three near simultaneous hurricanes on the Gulf Coast - all while you're attempting to fight a war on terrorism...it makes for a full day as an Air Chief.

It also makes for a full day to think of ourselves as a member of the joint team and a coalition team and how we deal with these problems of global proportion. So when I think about agility, I put that in the context of today's world. What does this mean today? What does this mean for programmatic decisions and personnel decisions? What does this mean for infrastructure and military construction decisions, for recapitalization decisions across that entire waterfront?

Also when I think about agility I recall the words of a great American football coach from my alma mater Texas A&M, a fellow by the name of Bear Bryant who later defected from Texas A&M and went to the University of Alabama and took the University of Alabama to multiple national championships, quite to the chagrin of my alma mater. But he used to say that he wanted his football team to be "agile, mobile, and hostile." I think that's pretty much what we're talking about here. I want my Air Force to be the same. I want it to be inherently agile,

I want it to be inherently mobile, and certainly hostile.

So how do we do that? Well, how do we shape where we are which are the legacies of the Cold War, to where I believe we need to go which are manifestations of an information age where things, thoughts, ideas, the global economy, message, money moves through cyberspace and through the internet at the speed of light. How do we deal in a world that is fundamentally different than our fathers' and our grandfathers'?

When you think in terms of cyberspace, for instance, trillions and trillions of pounds and dollars and yen and euros are traveling through that medium as we speak. As well as billions and billions of bits of information that make up our health records, our finance records, archival data of governments, all live in this untouchable, hard to understand world of cyberspace.

When you talk about the media and when you talk about access to information, and our opponents are learning to live in that world and they are learning to operate in that world very comfortably. What does that mean on top of the requirements left to defend the countries? And on top of that to maintain the notion that the mission of the Air Force is still to fly and to fight. So I want to share what we are trying to do to get at this new world and to shape and transform the American Air Force into something that is perhaps fundamentally different than it was when I took the oath to defend the country in 1967, 1968.

This agility, I believe, is demonstrated in a number of ways. One contemporary example is the strike on Abu Musab al-Zarqawi. This is a remarkable story in the evolution of air power. The F-16s that launched out of that expeditionary base that day launched on a mission of reconnaissance with precision bombs on board to go out and fly along lines of communication to look for improvised explosive devices to reduce the attrition on land component activities. While they were out, Special Operations Forces were able to narrow the list down to locating al-Zarqawi and his party in a safe house, which was then passed to the CAOC, which assessed collateral damage and blast effect mitigation, passed that to the fighter, recce'd the fighter over the top of the house, while literally still on the tanker. Cleared the final drop, signaled laser-guided weapons, and then was asked to drop a second 500-pounder which was a JDAM.

I think this is a typical illustration of what agility means to an Air Force. This was not the first time this pilot had thought about this. Over countless NATO TACEVALS, over countless operational readiness inspections, over countless sorties at Red Flag, over countless composite force training exercises and exploration of rules of engagement and special instructions. We had trained our Airman to be inherently flexible and adaptable or agile. So while tasked to go out and look for IEDs and people that are setting up explosives on roads, the mission turned into a strategically dislocating event for the opposition. While the original task was not to deliver ordnance, at the end of the day two 500 pounders were delivered with strategic impact on al-Qaida. No other component can make things happen that fast, not land components for sure, nor naval components. So what do we pay for that? What are we doing as far as organizational constructs to benefit from this sort of thing, to benefit from this sort of thinking?

The laser weapon is also a good story. In my Air Force's activities in Southeast Asia during the '60s and '70s, we went after a couple of bridges in North Vietnam. One was called the

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Paul Doumer Bridge, the other one was called the Thanh Hoa Bridge. We flew mission after mission after mission against the Paul Doumer Bridge, and in fact we lost over 100 F-105s trying to attack that bridge. In fact, over the course of the war in Southeast Asia, we lost half of every F-105 ever built over North Vietnam. Of the 50 percent that were shot down, one-third of the pilots were killed; one-third of the pilots were captured; and only about one-third were recovered [picked up] because of the distances up north around Hanoi. So against the Paul Doumer Bridge we lost over a wing of fighters, not to mention the lost pilots. Folks at Eglin at the Air Armament lab began to think, “Why can’t we laser guide a weapon? If we can laser guide a weapon then the accuracy of the weapon and the flexibility of the airplane would be certainly significantly enhanced.” So they did. They worked that. And as we have seen, in May of 1972, the 8th Tac Fighter Wing, the Wolf Pack, dropped the Paul Doumer Bridge, with their big F-4s loaded with a pair of weapons each. So what had cost us a wing of F-105s plus all the pilots, we were then able to drop [the bridge] in a single afternoon with one of the technological advances of that war.

So, from the exploration of technology to all the things that we have done together, let me talk you through some things that I think you will find consistent. Yesterday was very helpful to me; we talked about personnel and we talked about cuts, we talked about jointness, we talked about joint representation, because I’ll tell you quite honestly, every single one of those issues is absolutely consistent with the challenges in Washington as they are with the challenges in London or in Norway or wherever our forces operate.

Our Department of Defense and our Air Force is in the process of transforming itself in a way that we haven’t done in the past. This is a true generational opportunity to change how we fundamentally do business, to move from a garrison mindset into an expeditionary mindset at levels that cut across the entire Air Force. It’s an opportunity to become much more agile and much more flexible. It is an opportunity to become much more interdependent.

Let me share a thought or two with you here. From the Southeast Asia experience we learned or we operated under the guise of “we will just stay out of each other’s way.” The Navy operated an air effort; Strategic Air Command operated an air effort; Electronic Security Command operated an air effort; 7th Air Force operated an air effort; and there wasn’t a single CFACC or JFACC. So we divided Southeast Asia, North Vietnam, up into route packs. The Air Force would operate X number of route packs, the Navy would operate X number of route packs and we’d just stay out of each other’s way. But deconfliction like that is not an inherently operationally sound model in my view. Out of that we learned that we need to do that in a much more interoperable manner. Out of countless Red Flag exercises at Nellis, we thought through the mission of being able to train and being able to work with partners and being able to share ideas in the high desert out at Nevada and not have to learn these lessons all over again in combat.

In August of 1990, for Operation Desert Shield and Desert Storm, we collectively deployed into the Arabian Gulf area. We entered into a war where we were *interoperable* in Iraq. That’s a much better place to be than deconflicting. But after *interoperability* there’s another world. There’s a concept beyond *interoperable* and it’s called *interdependent*. That’s the path that I’m trying to take. I believe there won’t be enough money, I believe there won’t be enough people, I believe there won’t be enough time NOT to be interdependent. I believe we have to look at

things in a much more different manner, and I mean that in a joint sense but also in a coalition sense.

When you see what my Secretary of Defense says and what I say about transformation, what's not said in there is that the Air Force is essentially leading this effort of transformation. Although our challenge is really no different than any other folks', sometimes it seems like it is different because some in the media and some academics assume that infantry – the notion of “boots on the ground” – is the only way to solve the world's problems. Of course we know that's not true, that jointness and interdependence are not only here to stay but make us the incredibly strong fighting force we are, but we are all too gentlemanly and ladylike to take them on in that light. But when you get into the notion of interoperability I think it begins to open doors so that you don't have to have personal fights. You can talk about things that an Air Force provides to the joint commander, the land component provides, a maritime component commander provides and you don't have to cross over into some of these petty arguments.

I would offer to you that our Air Forces have collectively been fighting solid for 15 years. When we say this in the discussions that we have in Washington it's a bit of an eye-opener for folks who haven't thought about it. This is a significant notion, that our First Fighter Wing deployed to the eastern province of Saudi Arabia in August of 1990, and we've been in the Arabian Gulf in combat ever since. When you think about it, when hostilities began in January 1991 for Desert Storm we only *began* fighting. We spent the next 12 years in no-fly zones, in both North and South. And beside the No-Fly Zone business we've done Vigilant Warrior, Desert Strike, Desert Fox, Bosnia, Kosovo, and a variety of other humanitarian events: Mogadishu, Somalia, Madagascar, Pakistan, our own Gulf Coast, et cetera. So for 15 straight years the air component has been in combat.

Another interesting note is Afghanistan, where we have been in combat from 9/11 to the present longer than the American experience in World War II. So the lessons learned in this -- as far as being agile, being nimble, being mobile -- the lessons learned in this as far as being expeditionary and how to move into these areas of the world offers us perhaps the most magnificent laboratory...and that's very hard to argue with. So when folks say we have been in Baghdad for X number of months my comment is we've been in the Arabian Gulf in combat for 15 years. We've been in Afghanistan longer than the American experience in World War II. And on top of that, the Air Force has also done operations in defense of the country. We call that “Operation Noble Eagle.” Since 9/11 we've had over 100 aircraft wrapped up in this notion of Homeland Defense, fighters either airborne or on ground alert, multiple tankers, multiple AWACS, from north of Fairbanks in Alaska to over Honolulu in Hawaii to New York and Washington. So while combat occurs in Afghanistan and Iraq, the Air Force is still operating over the top of the country just like the Royal Air Force and others have done historically. So as we look at these lessons out of 15 years of fighting, out of contemporary activities, out of historic activities as we move from deconfliction to interoperability to interdependence, what does that mean to us? We have close to 100 initiatives we are pushing to make the Air Force more nimble and more flexible. We have 67 or 70 or so that are primary initiatives and others that I'm not going to go through with you, but I'll offer some thoughts on them if you have questions. But I want to talk to you about some specifics regarding our priority initiatives first. We are in the process of losing about 40,000 people. We say “40,000 people,” but what we really mean are “40,000 full-time equivalents” which really is about 57,000 people when you

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consider our Air National Guard and Reserves. I've caught reasonable flack over this.

My answer is, we can be smaller because we can be more nimble. We can be smaller because the new systems don't require as many crew chiefs. They don't require as many back-shop maintainers. They don't require as much airlift. These systems are much more flexible, inherently, because it's designed into them. So the old depth of support personnel we don't need. As we look at the recapitalization of our aircraft inventory, the new aircraft require less people. Also, we had a chance to talk a little bit yesterday about this, that in my Department of Defense there are four colors of money that I have the pleasure and honor to have to deal with every day. We have our *personnel accounts* which we have 365,000 or so active duty; a total of about 700,000 in the Air Force when we count Guard, Reserve, civilians and active. The second color of money is *reconstruction and MilCon* which is our bases, the infrastructure of our bases, hangars, et cetera, just like everyone else. The third kind of money is our *operations and maintenance* money. Since we're at war, our flying hour money, our training money is constant. The infrastructure and MilCon money is constant. We're trying to go after that with another Base Realignment and Closure activity or BRAC which with our Congress BRAC is surely a four-letter word so I've told the Congress and testified to questions about base closures. So when you hold the people constant and the Congress mandates that we hold the bases constant and you hold the flying hours and the training and the preparation for combat constant, then the only place you can go for money is the *investment account*. That's the fourth color of money. That's the new equipment.

Historically we have held the people constant, we have held the bases constant, we have held the flying hours constant, and we have raided the investment account. The result is today the American Air Force operates the oldest inventory it has operated in the history of the Air Force. Our tankers were built in the '50s. Our bombers were built in the '50s and '60s. Our fighters -- our main line fighters -- are 23 or 24 years old. Today, the average age of the Air Force inventory is 23.8 years old. When I put the uniform in on 1967-1968, the average age was eight years. If we get everything that we are programmed for [in our future years defense plan], the age will grow to 30 years. So there has to be a way to break the cycle. Given only those four colors of money, you have to be able to figure out a way to break this cycle.

What I have proposed is we give up people. The systems will give us efficiencies, the systems will let us operate with fewer people. Since my desire is to be able to recapitalize this Air Force, our personnel account is one source of the money. I'll talk of a couple of other sources about efficiencies, but that sets the tone for all of the other activities as we look at transformation and we look at the new world.

The objectives and priorities that I've given and have worked with my staff on are:

To be able to fight this global war on terrorism better, to fight in a more interdependent manner, to fight it in a more joint and coalition manner, to be able to highlight the use of special operations, land component, maritime component, and air and space component on an equal footing.

The second priority for me is to take care of the people. It sounds like I'm talking out of both sides of my mouth when I say I'll get rid of 57,000 but I want to take care of them, but it's true. Every one of the 900 or so lieutenants that we have reduced our force by I have sent letters to. We have worked this, we have offered some of them movement into the Guard,

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movement into the Reserve, movement into the civilian sector of the Air Force or movement into either Navy, Marine, Coast Guard or Army before we showed them the door on the way out. I call this an “opportunity ladder” to be able to highlight their contribution and be able to continue to serve the country in as much of a dignified manner as we can.

57,000 people is a lot of people to lose. So this is creating a bit of struggle in my world and we are looking at a variety of ways to continue to focus on the human capital. I'll tell you, it's no different than any other air force: our people are the biggest treasure. Our people are so important to us, but they are also the most expensive commodity. In my country every one of us, whether it's the newest Airman or the oldest geezer in the Air Force average about \$100,000 a year in pay and allowances. So for every 10,000 people it costs us about one billion dollars as far as capital investment. So if this system can get you to smaller numbers and if the new world can allow you to operate smaller, and if you have to hold those other accounts constant as you reinvest, then taking the numbers of people down is the only way to do this.

We've focused on warfighting headquarters. We have focused on streamlining our headquarters staffs. I'm going after large numbers of people on the staffs. Interestingly enough, people on the staff tend to be more senior. That creates a whole different battle because most of the people on the staff are senior NCOs or lieutenant colonels or colonels. I'll give you a couple of examples. We have in each of our major command staffs 100 to 150 personnel officers. Air Combat Command,

Air Mobility Command,

Air Force Space Command,

Air Education and Training Command, US Air Forces Europe, US Air Forces Pacific, all have between 100 and 150 personnelists. Now, I've worked in personnel, so I can say this: I'm not sure what they do. We have an Air Force Personnel Center that establishes policy and programs folks' assignments. We have senior officers and senior NCOs that worry about this. So I'm not sure what those 150 people do in each of those major command staffs. We also have various tribes of civil engineers. If you are at Osan, Korea, and if you wanted to enhance the dorms for the enlisted troops you have a 51st Fighter Wing Civil Engineer; a 7th Air Force Civil Engineer; a Pacific Air Force Civil Engineer; a Headquarters Air Force Civil Engineer; and we have a field operating agency that is nothing but civil engineers. Again, I don't know what they do. It seems to me that we have checkers checking checkers who check checkers along the way.

We were just talking about this the other day, so I asked some questions because I just wanted to know. In fact, I've asked a couple of questions of the staffs, questions that I already know the answer to, just to see how long it takes the answer to get back to me and to see who coordinates on a sheet that provides the answer. Amazing. I don't know what all those folks do every day, but I believe we can reduce those numbers on the staffs. The same with communicators, the same with some of the others. I've also established a Directorate of Development and Assessment – an “A9” – because when you fight for 15 years there's lots of things that you learn along the way that you need to get into the budget program and put resources against. We've normalized our AEF rotations. We've become much more lean in expeditionary operations, and we've learned so much about operating on expeditionary airfields that it's taken us to a different place relative to defending the airfields, operating the airfields, setting up the airfields, and in each of those we focus on contingency response groups

that are bodies of mixes of combat engineers, air traffic control, and security forces that go in and take an airfield, and then own the airfield until they turn it over to regular forces, et cetera. We have two wings of those, East Coast and West Coast; and we have two groups of those, one at Ramstein and one on the island of Guam. We've used those quite extensively in Iraq and Afghanistan and I'm very proud of what they do and I'm focusing more and more on that particular aspect of getting expeditionary.

In the world of interoperability, though, I'm not happy that I can't depend on land component operations to defend the airfields. We all know that our Army thinks it has other things to do other than defend the airfields. Therefore we're having to look at ways to protect our forces, to buy equipment and to set up activities to defend our air bases. Our opponents' 82mm mortar has a range of about 3.5 miles. Their 122 rocket has a range of about 13 miles. How do we defend the airfields from 3.5 to 13.5 miles against mortars and rockets while holding as sanctuary the arrival and departure corridors on the airfields while we prevent activities that are threatening the operation of the airfield? Again, there's not a plan, and so this is one of the items that the Royal Air Force and the US Air Force share. I am looking to you for some help and some mentoring on how you do this.

We're looking at ways to shrink and reshape this force. As I mentioned, 57,000 people is a big bite. But I also have discovered that, from September 11, 2001, to today, we have only deployed about half the Air Force. We still have 112,000 people sitting in missile silos and doing space activities. That's okay. On any given day we have 53, 54 percent of the Air Force that is tasked to a combatant commander -- be it EUCOM, PACOM, STRATCOM, NORTHCOM. That's okay. But I've got *half* of the Air Force that has not deployed and we've been in Afghanistan longer than World War II. Something is fundamentally wrong with the system that we have with this force because I can't get at half of the gene pool in the Air Force to be able to fight. So that is another of my objectives -- to get at 100 percent of the Air Force. In 1999 we had 22 or so percent of the Air Force in an expeditionary deployment bucket. Today we have 85 percent and I'm still not happy. I want to know who those other 15 percent are. Where are they? Who are they? Why are they not deployable?

We also have an interesting trick, and I'm sure other Air Forces are the same. I have on any given day 10,000 people that are medically disqualified. Five thousand are righteous: They're pregnant, hips are broke, legs are broke...we're going to fix them and get them back. But I've got 5,000 people who on any given day -- when the rotation schedule comes out to go back to Baghdad or go back to Kandahar or Bagram -- they get asthma or they have lower back pain or they have some other issue. That was one of the questions that I knew the answer to before I asked.

So I asked, how does this happen? Flight surgeons came in and said, "Sir, we're the ones that approved those medical waivers." I said, "Do you talk to commanders? Do you talk to first sergeants? Command chief master sergeants? Do you talk to lieutenant colonels, sergeant majors?" They said, "No, we just approve those waivers."

"Okay, how about tomorrow morning we have the commander make that choice." Now from my force of 5,000 people that normally get sick before deployment, they can get sick at al-Udeid, they can get sick at Bagram or Kandahar, or they can get well. It's up to them.

These are things that are internal to an Air Force when we talk about getting our hands on the people and getting our hands on the ability to deploy.

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I tell you, I'm finding this interesting because in my Air Force there are sanctuaries out there of people and activities that view themselves separate from a deployable, expeditionary body.

We're looking to continue to integrate our active with our Air National Guard and our Reserve. Our Air National Guard belongs to the United States federal government but it also belongs to each of the states. There are 54 adjutants general that own flying machines and people inside the Air National Guard. I sometimes think of them as "54 independent city-states" because they at time have no allegiance to anyone other than themselves. But they are coming along because they see the future the same way I do. The country's at risk, the world's at risk, and along the way this will all be better if we're working this business of being interoperable.

We've also looked at streamlining our business practices, and I'm not a business major, finance, business, accounting, but I've asked, "Why does it take so long to get an airplane out of our depots?" Up until a year or so ago it took over 400 days to get a KC-135 through our depot. Not because we had bad people, and not because they did anything wrong, it was the process was so onerous and so Byzantine that it took 400-plus days to get one of the tankers out of depot. In fact the operational impact of that was that one-third of our tanker fleet was tied up either being grounded going into the depot, in depot, or coming out of the depot. Now because we've focused a little bit on the business practices, we've got that down to less than 200 days. So we've effectively doubled the effectiveness of the depots. The people up there are much happier, I'm much happier, we have more flying machines that we can deploy with. But think about 400-plus days of process it takes you for one of the key enabling pieces of equipment that you have. You cannot get your hands on it for well over a year. That is not being agile, that is not in any way being nimble.

We have also combined our training practices and our separate Warfare Centers. We used to have a Space Warfare Center, a Mobility Warfare Center, and an Air Warfare Center. We have now merged those into one. One Air Warfare Center. We used to have a Fighter Weapons School that included intel, air battle management, space, it included combat rescue, and we've merged mobility into the weapons school. Until recently we had two weapons schools, Mobility and then the US Air Force Weapons School at Nellis, now we have one.

I share those with you because the training, the experience, the understanding across each of those examples is so critical for us as we look at shared operations abroad like al-Udeid and Balad and Al Basra. Because we don't deploy as separate entities, we don't operate as separate entities, we operate as an air component. We've also worked very hard with the Joint Air and Ground Operations Group out of Nellis to get better at close air support and better at urban CAS. We've looked at expanding the world of the Aggressors out at Nellis. We're blessed to have Royal Air Force participation of pilot, intel, and weaponry people out there. But this is not just about a flying machine aggressors. This is about space aggressors, information operation aggressors, threat experts, all in one place. As well as the exploitation opportunities in one place.

We've got to streamline this so we can get much better and much quicker at seeing something, analyzing something, and returning it back to the field as the red team effort so we can train against it.

We've extended our basic military training by 2.5 weeks. I wanted to go four weeks but I couldn't get the money. Last night at the dinner I told some folks how I got most of the money to extend it by 2.5 weeks thanks to "negotiations" with our Senate Armed Services Committee. I told the Chief of the Air Staff that I was a little embarrassed that I was out in front of the hotel on my hands and knees begging for money. The cell phone in my ear. If it worked, I'm okay with that.

But our basic military training, we have looked at this in a completely different light. These kids get the rifles day one. Each recruit keeps that rifle throughout that whole experience. Each recruit will qualify with the rifle and qualify with the pistol. Each recruit will spend much more time talking about the laws of armed conflict, talking about how we do business in an expeditionary sense. We will spend much more time in the field attacking them, confusing them, having them set up cantonment areas, having them move from cantonment area to cantonment area. A piece of this that I'm extremely excited about is every single one of these youngsters will come out of our basic military training in the future with the equivalent of emergency medical technician qualification.

The United States Army only sends ten percent of its recruits to train them on medical care, combat care. The Navy is not as concerned about this because they have the ships and they spend more time fighting fires on ships, et cetera, which is valid. But in our case, I want every single one of these young women and men who come through this to be able to do self aid / buddy care and be able to do emergency medical care. Again, the 82mm mortar has a range of 3.5 miles and the 122 rocket 13 miles. Our airfields in CENTCOM are being mortared and rocketed every day, so I intend to have these people much more capable and taking care of themselves and taking care of their fellow Airmen or the others that are there. So we're moving out on that in a very rapid way.

These expeditionary skills, I believe if you teach them this, if we can imprint on them from day one we will be in a much better position than we have been in the past. We've also modified our tech schools. The Air Force -- our Air Force -- is the only service that sends every kid through basic military training and then through a tech school and then out to the field. Our tech schools we have remodified again into more expeditionary stuff. We are focusing on the ground combat piece of this for pararescue, special tactics, combat controllers, terminal air controllers, et cetera, at one place. Again, focus on the people that make the agility happen.

Another piece of this is for senior NCOs and officers. At our Command and Staff College beginning next month and at our Senior NCO Academy and our Air War College at Maxwell, every student will have an opportunity to take a language. I told them, you will take a language, you will take the test, you will pass, and you will enjoy it. The languages are Chinese, Arabic, French and Spanish. Spanish because of Central and South America. French because of Africa. Chinese and Arabic, obvious. I know they will not come out being native speakers, but I know they will come out of with an appreciation for the nuances of the language and some terminology that will be helpful. That will help us focus each of them on a region and keep them focused on a region for the rest of their careers. The language may be noteworthy, because I know in this room some of y'all don't think we're able to actually speak English, so we should look at perhaps learning English in a different way, but I've totally run out of time, and we can't teach them English as well as Chinese so we'll try to focus on the Chinese piece and the Arabic piece.

Let me close with a couple of other things that I think will be useful for discussion. I think an air force is inherently different than an army or a navy. But I think we have not done a very good job of articulating what does that mean. Let me share a couple of observations and then what I'm trying to do about that.

An Air Force sends its officers out to fight. An Army, a Marine Corps or a Navy sends its enlisted corps out to fight. Because we send our officers out to fight and because our officers are combatants, we have a completely different view of this business than the other services. It's natural for us. We grow up in airfields where we operate together. We grow up in CAOCs, we grow up in no-fly zones, we grow up and do business in Bosnia and Kosovo and humanitarian relief things and because the officers go out and fight and meet other officers, we have a cadre amongst ourselves that we are comfortable with. We trust each other, we operate with each other, we're officers. We are much more informal than an army or a navy for those reasons. Sometimes in that relationship we believe that others view us the same way. They don't. They do not view us the same way as we view ourselves. I think that is a blessing and a curse, and I think there's something there that is useful for us in our outreach to the other services.

The other part of this is we make this look so easy, people believe it is easy. It is not easy to build an air bridge. It is not easy to build an ATO. It is not easy to train lieutenants and captains to fly high performance aircraft to go out on a mission of looking at improvised explosive devices and then dynamically retask them through the CAOC to a new, strategic target, and have that occur flawlessly. That is hours and hours and months and years of training, of thinking, of NATO tactics, of Red Flag. We make this look so easy people think it is easy. Of course we know it's not. We do not do ourselves a favor when we fail to explain how complicated this business is and what this means to us relative to having control of the tankers and long-range strike and the ability to generate sorties of expeditionary airfields, et cetera.

The third thing that I believe has hurt us is that we have, I'll say we, the American Air Force, have made it one of our mantras that we are the enabling force. Whether it is space, geosynchronous orbit, low earth orbit, whether it is weather, early warning, communications, whether it is navigation mode or GPS timing we say we are the enabling force. Our airlift aircraft move people. We set up things for our other people. We provide imagery for other people. Pretty soon folks believe that your only function in life is the enable because we don't go out and engage as aggressively as we should. So when an Air Chief says I need to build a new (fill in the blank) bomber, we're immediately told "You're not Joint" because the soldier says that's not an enabler function. So does this thing matter in the joint world? Of course it does.

The arguments we have to continue to stress are that the air and space component is as lethal as the land component as the maritime component...with as many challenges on equipment, on training, on rules, et cetera. So I think we have not done a good job. I think we like each other, I think we operate with each other, our officers go out and fight, they have relationships, we make this look so easy people think it is easy, and we have sold ourselves as the enabling function as opposed to a primary strike function. I'm saying that about us, the U.S. Air Force.

So as I look at recapitalization of the American Air Force I am looking at losing some of these old aircraft; I am looking at an Air Force in the future that will be about 15 percent fewer fighters because the new fighters will be much more capable; I'm looking at about 20 percent fewer tankers because the new tanker will be much more capable and generate multiple sorties; but I'm also looking at 50 percent more long-range strike; I'm looking at about 30 percent more SOF; about 20 percent more combat rescue. I'm looking at about 45 percent more ISR assets and about 73 percent more Unmanned Aerial Vehicles. And I'm looking at about 10 percent more airlift platforms to be able to do business in this new world.

Let me close by saying as we work through this business of how to be agile, as we put our money where our mouth is, the objectives for me are to be able to fight there, to be able to take care of the people, to recapitalize. And as we look at this, in my world the legal requirements that I have to "Organize, Train and Equip," we're looking at a complete restructure of the organization, to flatten the staff and get rid of dead weight. We're looking at training opportunities, how to roll in and integrate lessons learned and roll in how to do this business in the existing world and perhaps the new world. The equip piece goes back to the recapitalization, getting rid of these old airplanes.

I've asked the Congress to let me get rid of 953 airplanes over the next five years. And as I testified earlier this year about these airplanes, we can incrementally let these airplanes go without threatening our ability to give the Combatant Commanders the air power they ask for and need. But Congress has restricted me from retiring some of these aircraft, including some that aren't combat-capable. I'll have a chance to provide a report card eventually, and I'll point out the congressional limitations on retiring up to 15 percent of the Air Force inventory, including old B-52s, U-2s, C-5s, C-130Es, KC-135Es, et cetera. We need to retire these obsolete aircraft, and modernize the ones that remain.

So let me close by saying I'm looking forward to the comments and questions because I believe we're all in the same boat. Let me thank you again for the opportunity to share a few thoughts with you, and let me thank you again for the opportunity to express some frustration with you because I think the Air Force needs to do better telling our story. There are so many ways that we can engage. There are so many ways we can engage with the world, there are so many ways we can access this better than we have in the past. Again, I think we're comfortable in this because we all know each other. We're comfortable in this because we know how to make the impossible happen. We're comfortable in this because we're just gentlemanly by our nature and we have chosen not to be the aggressively "out in the public" services.

My task to my staff is to figure out a way to break that mold. To stop being a softer, gentler Air Force and to be something much more aggressive in detailing the attributes of air and space alongside the required attributes of land and maritime warfare to get better at this world we live in today.

AGILITY IN A MEDIUM/SMALL AIR FORCE

Brigader Morten H Lunde, Royal Norwegian Air Force

Introduction

The title of this presentation; “*Agility in a medium/small Air Force*” requires a short explanation. First of all the word ‘agility’ – what do we mean by that? I looked up in the good old Oxford Dictionary and Webster’s New Collegiate Dictionary what the word agile/agility really means.

Agile according to the Oxford Dictionary means to be quick-moving. Whilst Webster’s expands the meaning further to; “*marked by ready ability to move with quick easy grace*” and/or “*mentally quick and resourceful*.” And agility is the “*quality or state of being agile*.” In addition agility for airmen means, at least in my head, being able to deliver sustained operational effect on time and on target and to out manoeuvre the enemy. Secondly who do I represent? The title indicates a medium/small air force. I most certainly would define the Royal Norwegian Air Force (RNoAF) as a small air force. Currently we are 1590 personnel in the RNoAF, and additionally 1800 light blue maintainers who belong to the Norwegian Defence Logistic Organisation (NDLO).

Norway’s strategic outlook is primarily shaped by the country’s position within a power structure where the dominant actors are NATO, the United States, EU, UN and Russia. We are no longer facing the same massive threat from the east.

We are facing other threats just as challenging. Firstly – with a national focus and perspective, there could be a potential for incidents originating from discussions and disagreements over resources in the Barents Sea – oil, gas, fishery – a dispute possibly involving all these players. We need to be prepared for such contingencies just as much as for international operations. Uncertainty is a major factor to consider for anybody that tries to stay agile and adaptable. Secondly - you can scour the pages of the newspapers in the 80s and 90s and not find one incidence of the name Saddam Hussein, Osama bin Laden or Slobodan Milosevic. They were not in the news. Yet by the summer of 1990 and on through the decade of the '90s, these are the persons and forces that guided our activities for a full decade and into this century.

The change that we have experienced when these players came along required rethinking of our defence posture, and how we organised our approach to war fighting. Our ability to predict the future is not that good, and our lack of ability to predict demands that we at least try to be agile and able to respond to a variety of situations in the future.

The Norwegian Defense is currently going through the most comprehensive modernization after the Second World War in order to become more agile, and to make agility our trademark. The RNoAF started this process in 2000. The main aim was to change people, the organization and the overall mindset approaching the challenges the paradigm change after the end of the Cold War gave us. In the course of this paper I will focus on how we changed and are changing into a more agile posture – and some of the consequences of the internal process in the RNoAF and our focused areas for change, the focus on international partnership and force pooling, and maintaining agility in the future in a small air force.

A new challenge – the end of the Cold War

The reality check for RNoAF came when we joined Operation Allied Force in 1998/99. The need to transform the RNoAF, especially the combat aircraft force, from a static anti-invasion posture to an expeditionary agile air force became evident to us when planning for and participating in the Kosovo campaign. Key elements such as mobility, deployability, sustainability, adaptability and hence our agility in the combat aircraft force were nowhere near what was expected. We ended up looking after the Adriatic Sea with our F-16s.

This should not have happened. The challenges should not have been unknown to us. We had already participated with C-130s and Bell 412 helicopters in a number of operations from the mid 1980s, including participation in major air and land operations in the Persian Gulf and in Bosnia. However, these lessons observed were not analysed properly.

After all, except the units concerned, the rest of our system was in the “deepest feeling of a peaceful environment” ever encountered since the mid-1930s. The Cold War worked very much in the same way as a lullaby for the system.

I myself commanded our C-130 deployment in support of IFOR/SFOR from 1995 to 1997, and my experience was that I was in a complicated war/crisis situation whilst the rest of the air force lumbered along with their everyday life and problems. The same situation prevailed when we deployed our F-16s to Naples in support of Operation Allied Force a few years later. The mindset was very much static and stove-piped in each arm of the services, and nobody seemed to, or was afraid of, thinking outside the box. It seemed as if we had learned nothing from previous operations.

Agility was definitely not a trademark for the organisation. Something had to be done, and fast.

Creating the vision of change/Changing the Air Force

First of all we had to realise that something was wrong. Our forces didn't deliver what our politicians and the rest of the world was expecting – we had become irrelevant. We had dug in too deep waiting for the Soviet invasion. The first step on our way to a more agile air force was to change our focus and approach to problem solving and building of air power. This gave us the starting point we needed in order to build a more agile air force oriented towards the new challenges without having to fight our way through a long and devastating “war of fog and friction” within the air force itself.

Our next challenge was to create a vision and build a force designed and dedicated for international operations and national crisis management.

This meant the need for a more adaptable, mobile and flexible air force – properly equipped with a fast response time, or high degree of agility if you like to put it that way.

The force contribution and compilation should be individually tailored from case to case. This would have to be done within the framework of more tasks at hand, fewer employees, higher demands for efficient operations and a common mindset where decisions should be taken at the right level and at the right time in the military hierarchy. Our vision became **“fewer office chairs and more air power”**.

The following four cornerstones became paramount in our approach to a new air force: the ability to achieve a rapid response, with the minimum logistical footprint, to be network-centric and adaptable, and to achieve maximum operational effect as a small air force. Basically we focused on a number of key success factors to build a small, modern, highly agile and more adaptable air force that would be a preferred partner air force for future operations in alliance and coalition warfare. This meant developing a vision, and associated strategy and related concept, followed by the necessary human capital with the right knowledge and competence. The correct technology and weaponry would also be required, as would the development of international partnership and cooperation. I will now look at each of these elements in turn.

Vision and strategy/focus areas

The RNoAF has chosen the motto; “Aiming Higher”.

This mirrors the over-arching goal to get better both as individuals and as an organisation every day. In addition we have the in house ambition described as “Best at what we are doing” – realising that we can’t do everything but what we do we will do well.

Actually we wanted “Just Do It!” – but this slogan was already taken. This encompassed the vision of putting the war fighters in focus, reducing staffs, empowering at all levels of the organisation, and giving responsibility and resources to air wings and the Defence Logistical Organisation directly.

The requirement for checks and balances was to be conducted through written contracts between the CAS and those who received money and resources.

Our new CAS in 2000, Major General Archer used very much of his time and energy visiting units and personnel in order to bring home the meaning and importance of the ambitions of the new agile air force. His personal leadership and involvement was a major success factor on our way forward. Another key contributor was the Balanced Scorecard tool for implementing a new strategy and surveying our strategy development as we went along. However our first attempt at creating a strategy map identified 10 executive leaders with 104 main goals to focus on, so it became clear that we did not have a common picture of what we wanted to achieve. In order to keep it simple it became obvious that there were only three questions to be answered; what was our present position? Where did we want to be in the future? And what did we have to do to get and stay there? The main goal of the process was to establish actual ownership of the Strategic Map and the scorecard within the leadership and make people understand what we were trying to do. The way to create the best possible results relied on trust, involvement, frankness, responsibility, and in particular a willingness to see the best solutions for the whole organisation.

From this approach developed a new basis for an agile small Air Force which saw a change in focus from territorial defence and defensive counter air operations to expeditionary air operations, and a mix between air to air and air to ground operations. Much greater flexibility and mobility in organization and equipment, and all base support located in a separate unit capable of supporting any air element (from F-16 to transport aircraft and helicopters) if necessary. Units were to be flexibly structured and organized to match different tasks and operations, and aiming for quality before quantity. But it was also important to consider the defence of values and job satisfaction – being a military airman is not a standby status but a challenging occupation. And in order to enable all of this it would be necessary to minimize “Red Tape”.

Concept

We made a strategic decision to follow the principles in a M2N-concept (Mobile, Modular and Network Centric) as a tool to achieve the aim of becoming a credible and agile Task Force for the future. By these terms we meant: Mobility - the rapid generation and deployment of force- and support modules in the right time to the right place; Modularity - having cost-effective, reduced-footprint, flexible and scalable broad units; Network Centric and Adaptable – modules operating in an integrated manner across all levels, joint and combined, and interoperable with key partners

As a result of the concept we defined what we call *the Smallest Operational Unit (SOU)* and *Smallest Deployable Unit (SDU)*. An SOU is the smallest unit that gives a substantial contribution to an operation. That means capable of conducting more or less independent tasks and missions. An SDU will be the smallest unit capable of being deployed abroad. Such a unit will not be able to operate independently, but in cooperation with other allied and coalition forces. The size of a SOU and SDU will vary dependent of weapon system and type of operation. For fighters a SDU will typically be from 2-4 aircraft. It can be a single transport aircraft or could be one single radar unit NASAMS/GBAD. A fighter SOU on the other hand would be between 6-12 F-16s.

This modular design makes us light, mobile, flexible, adaptable and agile. If we can not contribute with much, we could at least contribute with something and on a short notice. Together with allies and partners we can be a significant force in any operation. I will come back to the EPAF-cooperation later in my presentation, but in sum we think that this approach helps us to be relevant in current and future operations. As LEGO pieces can be a house today and a car tomorrow, these SDUs can be an integrated part of different operational organisations and structures. We don't know what tomorrow brings, and our elements must be small and flexible enough to adapt into any future challenge.

The Human capital

Building agility and making it the trademark for the RNoAF means trusting, believing, focusing on and communicating with the human capital in the organisation. In order to break the demotivating chain of endless reorganisations and cutbacks in the organisation, and its negative effect on the fighting spirit we decided to let people do what they came to the air force to do in the first place. Fly, shoot missiles, conduct command and control and to maintain aircraft and maybe most importantly allow for local innovation.

And in addition we gave them resources and “freedom of movement” to do so within an overarching framework.

We decided to cut back on staff and HQ office workers and increase the resources going to the front end of the air force.

Today we have an Air Staff consisting of 23 people, an Air Warfare Centre of 150 people and a Joint Air Operations Centre (JAOC) consisting of 40 persons.

All of these can and will be used when conducting deployed operations if need be.

This move had an immediate effect on morale, innovation and operational effectiveness. For example, the total flying hours increased from 9500 hrs/year to 12000 hours/year on F-16 in two years and we went from single to multi-role capable force at the same time. Similar trends

were apparent for all of our other operational units. We also saw an immediate effect on decision making and the time from an idea was conceived to a solution/action was taken. Our staffs actually became more effective and agile as well.

The OODA-loop in the Air Force was definitively improved!

However it did also mean that the ops tempo is higher than before, which is always a challenge in a small air force. We have very few people in uniform – approximately 1600 operators. Fatigue is apparent in the organisation, and we have had to adjust our operational tempo somewhat based on our experiences. We need to look carefully at the rotation cycles of our personnel. 3 months for the leadership and 6-8 weeks cycles seems to be the maximum the system and personnel can absorb if we are participating in operations lasting 6 months or more. We have also reorganised the Defence Logistical Organisation. The reorganisation included job cuts and an approach towards outsourced maintenance and logistical services, with a separation between operator and maintainer. But looking back not all of these changes have enhanced our agility. Peace time operations at home don't enhance "*esprit de corps*", we don't train as we fight any more, and there are too few front line maintainers in the inventory.

A high ops tempo we find especially hurts the maintenance side of the house, and as a consequence people start to look for other jobs outside the air force. We are now in the process of changing this back to a more integrated operator/maintainer units. 1600 in the operational organisation and 1800 in NDLO are marginal in order to be an agile force. We hope that we can increase the numbers in the next Norwegian Defence Study.

Knowledge/competence

Air Forces are technology and experience driven organisations, operating advanced and costly equipment. Our main product is Air Power.

We are measured by the agility and effectiveness in this product, and the quality of the product will be dependant upon the quality of the limited number of personnel that we after all select, and in the end of the day have available. For the Norwegian Air Force high quality in selection, education and training is paramount in order to build agility. This begins in our selection process for aircrews.

This year we will select approximately 25 persons out of 450 applicants for initial selection flying, of which approximately 10-12 will become pilots and navigators. The surplus of the 25, who we considers to be the best of the best coming from the civilian side of the street, will be offered a opportunities within our C2 or GBAD system.

The agility factor is further enhanced through the alliance basic training that we do together with some of our closes allies in (define) ENJJPT.

The idea is that people who learn to fly the same aircraft together (e.g. F-16) will eventually operate together in allied or coalition ops.

We find that operators who know each other from basic training have their agility enhanced, and this same approach is taken for helicopter and multi-engine aircrew training. Later on in their careers we will build on this and seek knowledge, training and education from the best sources and institutions within the alliance where ever it is available. It is particularly important for small air forces to be able to participate in exercises and high standard training like Red Flag or Maple Flag in order to stay abreast with the agility and knowledge of larger air forces – to us this means benchmarking. Hence knowledge and competence from basic training, operations and advanced

exercises/training/education are the cornerstone for a small air force of today to stay agile and relevant.

Technology and weapons

Technology and weaponry will be another important issue for a small air force in the future. Technology and development of capabilities means in most cases a lighter logistical footprint, need for fewer maintainers but on the other hand a need for more operators to take advantage of the increased mission rate. We in the RNoAF will always chase and choose the capabilities that give most operational value for money. Whether this is commercial technology that can enhance existing or new systems, or new military technology and weapons that are within reach of our resources. We have established a concepts, development and experimentation (CD&E) activity, the Norwegian Battle Lab Experiment (NOBLE), to help us make it possible to stay in front when it comes to utilising commercial technology for military purposes, or expanding possibilities for military technology. NOBLE has developed from a single service initiative in the Air Force to a Tri-Service institution that really enhances our agility in joint operations. An example of this is the possibilities we have developed for streaming live video and information via commercial available hard- and software from F-16 to naval units, FAC and SF forces. This type of CD&E activity is most helpful in our efforts to stay relevant and adaptable for future operations, and helps us to stay vigilant with regards to future trends and developments.

All in all the transformation of the Norwegian Air Force has been a success.

We consider ourselves as adapted for current and future challenges within the limitations that any small air force has with regards to capabilities and resources.

We have contributed more or less continuously with air power to the UN in Bosnia, IFOR, SFOR, KFOR, Op Enduring Freedom, ISAF, Baltic Accession and Op Active Endeavour since 1993.

And in our own eyes the operational agility has become better and better.

We have established a new mind set, a new way of doing business, acquired new weapons and technology from 2000 – 2006, and set the standard for future development.

International partnership and cooperation

So far in my presentation I have focused on the internal transformation that took place in order to create the necessary agility in the Norwegian Air Force. But I have also alluded to the connection to, and partnership with, other medium and small European air forces in this equation of creating agility. The RNoAF is a small air force with limited resources and capabilities; the same goes for our partners within the European F-16 programme – the European Participating Air Forces (EPAF) – consisting of Denmark, the Netherlands, Belgium and Portugal – all small or medium sized air forces.

We could never as single stand-alone nations make any significant contribution in any international operation. We have all realised this and in 2002 we decided to combine our efforts as much as possible.

This was done through the creation of the EPAF Expeditionary Air Wing (EEAW) which was confirmed and formalised in a MoU between the nations in 2004. Agility in an international context for us therefore starts with international cooperation and force pooling between smaller air forces.

What is the EEAW?

Smaller nations face a big burden as individual nations participating in international operations. The number of personnel, support units etc. available nation by nation is, and will for the foreseeable future, be limited and maybe declining in the next decade. None of us would fulfil the true ambition of agility.

However if we together take a modular approach we can combine our efforts and become a truly agile force. The EEAW comprising a self-sustaining detachment providing air power with F-16M to the Joint Forces Commander was created for this purpose. The concept has worked very well in our operations with F-16s in OEF and ISAF, and is the basis for our participation with fighter aircraft in the current NRF 7.

The restrictions lay in national legislation and reservations to the Joint Force commanders ROEs. Furthermore we are currently limited in the ability to fly in, and especially maintain, each other nation's aircraft.

The same goes for flying within the tactical elements i.e. 2 and 4 ships. However the main gain lays in the ability to utilise each other's transport aircraft, refuelling aircraft, GBAD systems and force protection if needed, and logistical/maintenance systems such as housing and messing. The cooperation is based on commonality and interoperability between humans and equipment that are deployed for independent operations.

This helps building situational awareness and sharing of essential information, and hence improved war fighting capabilities within a deployed detachment as well.

As pointed out earlier this excellent partnership and trust in each other starts with basic training and using common platforms and equipment, and the benefits from the partnership include burden sharing, greater operational efficiency, more experience from live operations than would otherwise be possible, the opportunity to exchange information and smart ways of conducting business, greater agility at a low cost (4 F-16s and 85 persons in Kabul for 3 months had a price tag of 50 mill NKr (approx £ 4,5 million)), a positive effect on national air power development, a high degree of job satisfaction, plus the opportunity to catch the eye of the politicians- hopefully making it easier for them to say yes to future money to develop more air power.

Future development of EEAW

In the future we from the Norwegian side would in a combined effort with our partners look at, and potentially reconsider, some of the current limitations in the EEAW.

We are pursuing solutions for exchange and common use of components and spare parts for our jets. Since we are all following the F-16 M-programme it would take a minimum of effort to authorise our maintainers to work on each others aircraft.

This would be a true and agile approach to Performance Based Logistics and Maintenance (PBL&M). Similarly we would like to see a development of EEAW-like initiatives for MPAs and GBAD.

The current effort within the European Air Group – EAG – seems to take care of the needs within the transport and tanker world. Our aim is to make EEAW the most appropriate air power tailored to any multinational operation or coalition, and make EEAW into a NRF in a nutshell.

Maintaining agility in the future in a small air force

Agility is the quality and “*ability to move with quick easy grace*” and/or being “*mentally quick and resourceful*”. We must make sure that the transformation effort that we have produced over the last few years to achieve this ambition does not vanish again.

We must continue to produce an agile force of soldiers, NCOs and officers.

Without them the change and the fighting spirit is not possible. We must also keep a constant eye on technology development; apply smart ways of utilising the technology and find partners with the same or comparable technology as our own in order to share the burdens of operating and maintaining cutting edge military equipment. Furthermore we need to continue to be able to educate, train and fight along our larger brothers in arms. Isolation and too strict disclosure policies will hurt the smaller players in the long run.

Conclusion

Agility comes from within.

We as individuals and organisations must allow the war fighter and the system to develop and make way for innovation. As senior leadership we should not stand in the way, but instead help this creativity and innovation from idea to solution or action to the best of our abilities.

The principle of the OODA-loop very much applies for any air force that wants to be agile and to stay abreast with the challenges in applying future air power. Our own process and the process together with our EPAF-partners over the last 5-6 years have shown us that it is possible to have agility in today's complex war fighting environment even with the limited resources available to a small air force.

AGILITY IN THE LOGISTICS ARENA

Air Commodore Simon Bollom

Although logistics is not perhaps not the first area that springs to mind when the subject of agility is raised, it is certainly true to say that if we want to realise our aim of having an agile air force then agile support is an absolute must. And while knowledge of the various funding cuts that have been applied to the Tornado programme is generally well appreciated through the Air Force, together with the challenge that it has posed for all those involved in supporting the Tornado fleet, we still need to consider whether support transformation, not just Tornado's but across the air environment, is really going to stand up to the agility test.

So just to set the scene, a 'small' financial challenge was set in 2003 and this was the catalyst for the transformation of Tornado support. The saving targets placed were an aggregation of various wedges, and their combined effect was that the Tornado support team needed to deliver the same output as before - but for just under half the cost. On top of that of course, there were the End-to-End Study recommendations on manpower reductions which amounted to something in the order of a 25% cut in the manpower available in Tornado depth. So not only was there a financial challenge, but the requirement had to be delivered with significantly fewer people.

How are we delivering that transformation? The main tool that is being used is that of 'Lean', which is at least an approach that most service audiences are now familiar with. By applying the Lean process it is possible to rationalise the surfeit of repair capability that exists between the Main Operating Bases, Third Line and back in industry.

As part of this, the opportunity is also being taken to transform the way logistic support is delivered, and to do this within the framework of partnering with industry. In this model, industry will be contracted to deliver the totality of depth support through to the front line. Progress so far has been good and at present the required savings targets both in cash and manpower savings are going to be achieved - although at the moment delivery of the right level of service to the front line is not being achieved, albeit this is perhaps not unexpected as there are a number of difficult transitional phases to pass through.

However, there is no doubt that the difficulties are being overcome, and delivery of a very much more effective and efficient logistics support chain is beginning to happen. There is no question that this rationalisation, the collapse of multiple facilities into single ones, the removal of manpower, the removal of inventory, has delivered a much reduced support tail - but the question that needs to be considered now is whether this new construct is perhaps too inflexible, and therefore lacking the agility that will be required in the future.

Recently attention has been turned to the front end of business, looking at how the aircraft are actually operated, how the training task is achieved, how the operational output is actually delivered, and particularly looking at how the deployed footprint can be reduced - an aspect that will be returned to later. At the centre of this has of course been the 'agile airman', the development of which is well covered in Air Marshal Dye's paper elsewhere in this publication.

But what are the characteristics of agile support? Top of the list has to be robustness, which in our terms means resilience to change – the one sure thing about mounting a military campaign is that change is inevitable. But dealing with complex and in some instances obsolete equipment brings further challenges - the Tornado was designed in the late 60s and early 70s, brought into service in the late 70s, and has to run on till 2025 – which means operating a platform that is 40+ years old. That means planning now to ensure that there is sufficient resilience in the support chain to be able to meet future requirements, but also ensuring responsiveness to changes in demand and operational concept is maintained. One of the dangers here is a tendency to closely tailor the transformation of support to fit exactly what is being done today. The problem is that there may well be other scenarios that the support chain has to be able to cope with, which provides its own challenges in terms of provisioning and funding support for something that *may* happen in the future. Support needs to be flexible, and it needs to be adaptable, and in the last part of this paper consideration will be given to the business of meeting new threats, how obsolescence can be combatted, and how embodying new capabilities in the sort of time scales that are going to be required in the future can be enabled.

However there are issues associated with logistic support that need to be tackled first. Foremost of which is what can be described as an urban myth or common place misconception, which is that it is possible to ‘over-lean’ a support chain. Well the fact is, that lean is about the elimination of waste, not the elimination of resilience. The problem arises when there is a failure to ensure the correct approach to lean is made from the start, in terms of the fact that the very first step is to identify value, or in other words what the customer (front-line) requires, and in this case that will be led by the nature of operations. For the military, part of the value stream should be the flexibility to adapt to new requirements or threats. So if the logistic support chain is constructed only to cope only with a single scenario, it will not be surprising that it is slightly inflexible in coping with other scenarios that might arise. This is the really difficult bit, and the bit that tends to get missed sometimes when engaged in this sort of lean transformation. Getting the requirement right at the outset is absolutely vital, and that involves an acknowledgement that flexibility is part of the requirement. However another misconception is that somehow a ‘fat’ and over-provisioned logistic support system is more agile than a lean one. Spare capacity is only useful if you plan to use it, and in the past, looking at previous logistic support systems – the surfeit of engineering capability, the excess inventory, none of which is truly available – did not provide us with the sort of flexibility and agility that is required. So, having quantity does not necessarily make you agile.

So, when is it waste or when is it resilience? Well stock levels are probably the first place people tend to focus in on and certainly in 2002 the value of the Tornado inventory was just about 1.4 billion pounds, but in terms of what was really needed, the figure then came out was probably about a third of that size. Indeed in 2004 a provision was taken against surplus stock of some £700 million, with a requirement to physically dispose of the surplus – which raises the question as to whether assets are really an asset, or actually a hindrance? The danger here again is that it is possible to be drawn into removing all surplus stock in the belief that actually all that is required is to support today's ops. The key here, particularly when drawing down, is to be able to reduce down to a level that provides a sufficient degree of contingency to support the essential range of operations – with the trick of course coming in the definition of what is ‘essential’. This is far more difficult when bringing a new platform into service, such as Typhoon, where every spare is a direct cash cost. For Tornado the majority of cost is in terms of depreciation and capital charge - but not cash.

Another area of concern – or interest – depending on the perspective is that of duplicate facilities. An example here is where two years ago the RAF had two engine bays, one at Lossiemouth and one at Marham, both producing engines, with between them a total of 56 strip and build positions. Now that leaning has taken place, the Service has a single support facility at RAF Marham, with only 10 strip and build positions. The question is, does that represent more or less resilience than before? Is it more flexible or more agile than the situation that we had before? A traditional approach would be to argue that with two bays there was a far greater degree of resilience inherent in the system, which in turn meant greater agility. The real point here though is that under the old system, both of those engine bays were working flat out to deliver the same requirement that is now being achieved with one, so what real resilience, capacity, or agility actually existed in the chain?

And then onto the most precious asset, that of our manpower resource. Turning to deployed support, and considering Op Telic, there are 6 Tornado GR4 aircraft out in theatre which require just over 100 Tornado tradesmen to support. It took something like 20 ISO containers to get the equipment out into theatre to support the detachment. Every airman in-theatre requires life support - feeding, accommodation and force protection - and then back in UK there is a gearing of about 4:1 to meet the harmony guidelines, meaning about 4 personnel in the UK to support every one deployed. So, one of the issues here is that a focus on the front end is needed in order to realise the benefits that provide the sort of flexibility and agility that the commander in theatre requires, and to minimise the overall logistic footprint. However there is a difficult balance to be struck here between building agility and resilience into a support chain, and the associated cost. Resilience is usually regarded as discretionary expenditure when faced with tight budgets. Quite often therefore resilience and provision against obsolescence is looked at as a 'nice to have', and these opportunity costs are often reinvested elsewhere. Now talking about focusing on the front end in a management summary, but what exactly is meant by this approach? Well, traditionally when driving greater effectiveness and efficiency has been attempted through the support chain, this has started by looking at the back end of it. So areas such as looking at reducing repair turn around time, how to make do with fewer spares, how to achieve faster deliveries – all of these have been the focus in the past. But what has been realised now is that if the focus is instead placed on the front end; looking carefully at how the aircraft are actually operated, bringing together the maintainers and the operators in a far closer relationship, it is possible to make best use of all the resources that are there to meet the flying task. Key to this is using industry's knowledge as a design authority, with appropriate incentives, to drive significant improvements in effectiveness and efficiency.

Having looked at the Tornado value stream, how the aircraft is operated, where risk can be taken, and where the demand variables are and how they can be smoothed – what is left? One thing is clear, which is that with an aircraft that is already 30 years of age, it is simply not going to be possible to make significant inroads into making the platform more reliable or more maintainable. That is a function of the design of the kit, which to a large extent, just has to be lived with. But what can be done to huge advantage is to look at the way in which maintenance is carried out and the platform is operated. The current statistics show that only half the sorties planned for training actually got airborne and achieve 'duty carried out' - only half! That is hugely wasteful, and focusing on the front end allows us to concentrate on where we can make improvements that have the greatest potential impact throughout the system.

Continuing with the theme of agility at 'forward', the fact is that when any platform is started up and then shut down it goes through a stress cycle which generates many minor unserviceabilities – something known to anyone who has ever owned a computer. Well, a considerable number of options have been explored to try and minimise the number of start up and shut downs, such as looking at engine running crew changes, hotpit refuelling – even up to repackaging maintenance, such that it can be done in small bites rather than the large chunks that take the aircraft away from the front line. But by far the biggest lever that has to be exploited is making better use of information. Take the codification of fault codes for example, where the phenomenon of an aircraft that has had the same fault 20 times over, and where the same LRI (Line Replaceable Item – or a black box for the non-technical) has been changed 10 times, is unfortunately not atypical – but why is this still happening? Why is it that systems are not in place to provide the intelligent analysis of the data that is available, and make sure that the fault is fixed the first time round. The key interface is, of course, the traditional one of communication between the groundcrew and aircrew. The third element at the frontline that has to be made the most of is having industry involved and bringing their expertise to bear early. Does this produce results, well yes it does, and this has helped to reduce engine rejections on the Tornado aircraft by something in the order of 50%. No magic applied here, quite simply making sure that the right information is produced, that we have both maintainer and design authority involvement at the front-line, able to make the decisions which enable those engines to be kept on the wing for as long as it is safe to do so.

Moving rearwards to consider our depth element, the people element has already been discussed to some extent, and in one of the other papers mention was made of the empowerment that lean brings. Well, most of the ideas actually do come from the shop floor. The engine support concept described earlier in which the requirement has reduced to 10 engines in repair from 50 before, providing far better support directly to the front line – most of the practical content of the initiatives that led to this situation came from the people that are actually doing the job. In many ways, Lean at its best is mostly about realising the potential of the workforce. In terms of the systems that have been set up to combine maintenance and upgrade, without doubt this was a 'no-brainer' but up until 2 years ago it wasn't done: there were separate lines for upgrade and maintenance – which simply meant less aircraft available to the front line. So with the pulse line concept and the consolidation of maintenance into a single depth facility, it has been possible to bring together all of the elements that have contributed towards maintenance and upgrade of the aircraft, so that they can be optimised both to meet the current task and be flexible enough to be able to deliver change when required.

Now let us move on and consider the problem of remaining agile in a world where the threats are ever-changing. The obsolescence cycle of a fast jet aircraft is probably in the order of five years, and without upgrade and update quite simply the level of platform capability will rapidly become eroded. Examining defence's performance in this area in the past is not reassuring: the last major upgrade that the Tornado had, the GR4 upgrade, cost over a billion pounds and took well over 10 years to get it into service. By contrast the Jaguar upgrade was complete at a fraction of the cost and delivered in 4-5 years because of the pull of an urgent operational requirement. So why is it then that in concert with industry it is possible to design and integrate UOR's (urgent operational requirements) and get them embodied onto an aircraft in a matter of months, whereas if the normal design authority route is used, the full modification service takes something in the order of seven years?

Perhaps more worryingly, the associated high cost of integrating new capabilities onto all air platforms significantly affects our ability to secure funding for future upgrades. So why does this problem exist? Much of it lies in the highly complex support chain that inevitably results from multi-national projects, with all the implications of work-share agreements which result in multiple agencies, multiple interfaces, duplication of analysis, duplication of data collection, reports being written, reports being rejected, a whole process industry. However if a lean approach is taken to all of this, it is possible to identify which of them really do add value. This was recently successfully proven on a small project – namely the integration of the AMRAAM missile onto the F3. As a conventional small pilot project it was unaffordable at £40 million, and was going to take 3 years to complete. But this was reduced to a £25m, 18 month programme, simply through the application of lean - by putting the people into just one location, ensuring single data collection and single data analysis, swathes of process could be removed safely – and the project was delivered on time. The key here is having a real and shared desire to improve performance, and being able to incentivise all parties so that it is in their interests to cut through red tape, bureaucracy and process.

At the heart of this is contracting with industry to deliver the totality of logistic support, however this is only going to work if it is possible to have agile contracts. It means that both ourselves and industry need to recognise that there will be demand instability, and that the requirements might completely change overnight – and to understand how the risks here can best be managed to minimise additional costs. But to do this there is a further need to work on ‘open book’ principles, which allow cost transparency in both directions, for without this it will be impossible to work closely with industry to work out how to meet the demands of a changing requirement in a way that is both profitable to industry and cost-effective for the MOD. And that is a challenge whose magnitude should not be underestimated. Indeed a large element of trust is required here to make this work such that it is possible to sit down as a truly joint team, and look at how it is feasible to deliver the requirement, veer and haul as needed, but all within a clear contractual framework. There is certainly a need to incentivise industry to deliver improved effectiveness and cost savings, but also a need to incentivise all areas of the support chain, to make sure that the Service element works efficiently and effectively as well.

In conclusion, this paper has set out an assessment of whether ‘Team Tornado’ is providing agile support for our future of the platforms. One of the key things that needs to be recognised though is that resilience is probably the key component of providing agile support, but resilience is not having ‘fat’ in the system – which is actually a hindrance – it is having the capacity to deal with the unexpected. If resilience is to be maintained within the logistic support chain, then it has to be recognised that this will require a certain amount of investment in latent capability. And it is imperative to work end-to-end to make sure that we engage the operators at the front end, and close the loop within industry, right the way through the logistic support chain. Everyone needs to be on the same page and committed to the same objectives of improving effectiveness and improving efficiency. The threat is agile too, and although only in a pilot programme to date, we have managed to show that we can cut through the bureaucracy that surrounds our upgrades – but there is a huge amount that still needs to be done to change a bureaucratic culture. But above all it is about getting the balance right. Infinite agility will cost an infinite amount of cash, and ultimately it is getting the balance of investment right that will be key to both meeting the uncertainty of the future, and providing logistic support that is lean and efficient to meet the full range of tasks.

PARADOXES AND PROBLEMS OF AIRPOWER

Dr Phillip S. Meilinger

When thinking and writing about Airpower over the past two decades I have often been struck by the paradoxes inherent in our chosen weapon. A paradox is, of course, a seemingly contradictory statement that may nonetheless be true. I have identified several of these paradoxes, and there may be others. The point is that identifying such oddities has more than an academic interest, and these contradictory and counter-intuitive statements can lead to confusion, misunderstanding and problems. My goal in this article is to illuminate the paradoxes in the hope that shedding light will also remove confusion – and we can begin by examining some very early perspectives.

“It is not necessarily impossible for human beings to fly, but it so happens that God did not give them the knowledge of how to do it. It follows, therefore, that anyone who claims that he can fly must have sought the aid of the devil. To attempt to fly is therefore sinful.”

Roger

Bacon

“When once you have tasted flight, you will forever walk the earth with your eyes turned skyward, for there you have been, and there you will always long to return.”

Leonardo da Vinci

From the very beginning of flight—actually from the beginning of *dreams* of flight—these contradictions have existed. Roger Bacon thought that flying was sinful. Da Vinci, on the other hand, thought it near to godliness.

“Pilots are a rare kind of human. They leave the ordinary surface of the world, to purify their souls in the sky, and they come down to earth, only after receiving the communion of the infinite.”

José María Velasco Ibarra

After the actual invention of the airplane, there were those—like Ibarra—who saw flight in almost mystical terms. The airplane would allow man to leave the squalid and banal existence of earth and move into the sky where there was freedom, nobility and purification. And to take this concept further, here is a poem written during World War I by Nino Salvaneschi, an Italian writer who was a contemporary and friend of both Giulio Douhet and Gianni Caproni, the aircraft builder. Yes, this is the format in which he wrote it, and we see here an attempt to illustrate how Airpower—the *offensive* use of Airpower—would bring about a new age of victory, and one, it is implied, that would not require the sacrifice of brave soldiers.

AIR POWER THE AGILE AIR FORCE

The supreme gallantry of the heroes of so many battles, from
so many countries, and the sacrifice of those who
gave their lives, are soon to
be rewarded with
victory.
Where
could we strike decisively?
In the air and by the air.
How can we all concur
with certainty
for victory?
With the bombardment fleets.
With a single command.
And a new air
strategy.

A slightly different view was expressed by Clement Ader, the noted French aviation enthusiast, who wrote in 1908:

“The great bombing planes will be veritable terrors! I am convinced that their awesome power and the fear of seeing them appear will provoke salutary reflections among the statesmen and diplomats who are the real dispensers of peace and war, and that in the final analysis these airplanes will serve the cause of humanity.

All of which leads us to our first and greatest paradox, namely that **“Airwar is so horrible it will be humanizing”**. From the very beginnings of flight there were those who saw both promise and pitfalls in the new airplane. Orville Wright once said that when he and his brother built the first flying machine they sincerely thought that it would make further wars practically impossible. The fictional writings of H.G. Wells and Jules Verne spoke often of this dual and paradoxical nature. They thought air warfare would be so horrible it would be humanizing. The theory went that war from the air would be so destructive that it might deter war from even breaking out. But if war did occur, then the inherently strategic and offensive nature of Airpower, which was then viewed as virtually unstoppable, would ensure that it would be over fairly quickly. This in turn meant that overall loss of life would be relatively small. 15 million died in World War I, so this was not a trivial consideration.

Just prior to the outbreak of World War II this theory seemed to be borne out. Hitler's *Luftwaffe* was viewed with an alarm bordering on panic that shook Britain to its core during the interwar period. In 1934 former Prime Minister Stanley Baldwin made his glum prediction that the bomber would always get through—and that would mean disaster for England. During the 1938 Munich crisis, trenches were being dug in Hyde Park and in Paris in anticipation of Nazi bombing attacks. War was averted, temporarily. As Lord Alfred Tedder indicated in his thoughts later on, “The real importance of Munich is that it was the first victory of airpower—no less significant for being temporarily bloodless.” The *threat* of Airpower, of strategic bombing, deterred war. The prophecy seemed fulfilled.

“To me our bombing policy appears to be suicidal. Not because it does not do vast damage to our enemy—it does; but because, simultaneously, it does vast damage to our peace aim, unless that aim is mutual economic and social annihilation.”

J.F.C. Fuller

In truth of course, that was not the case. War *did* break out, with Airpower playing a major and decisive role in eventual victory. At times it was indeed awful. Tens of thousands died in air strikes on Dresden, Hamburg, Tokyo, Hiroshima, and elsewhere. This was the horror that many people, airmen and non-airmen alike, had predicted before the war and which military thinkers like JFC Fuller found so objectionable in practice. Partly, the problem was that Airpower tended to lend itself to such graphic depictions. As a consequence, Airpower carried with it from the war a somewhat unsavory reputation. Clearly, airmen were hoisted on their own petard. They had warned people about the horrors of air attack, and the people and news media believed them and played upon those fears, accentuating every graphic image that displayed the devastation caused by Airpower—while seldom displaying that caused by other forms of war.

As an important aside, I would note that things have changed dramatically since then. In a remarkable report, Refugees International argues that the military capability of the US now allows it to intervene in civil wars or to counter aggressive attacks by other states with extremely low risk. It sees this as an important and positive development. In other words, because Airpower now allows the US to fight and yet cause little collateral damage or incur few civilian casualties, the US has a “responsibility” to intervene, worldwide, in order to save lives!

But returning to my main theme – what had gone wrong in World War II? Why was war not deterred? In my view, effective deterrence requires five things—my five “C”s. All must occur in order for deterrence to take place.

- **Capability**
- **Communication**
- **Credibility**
- **Concern**
- **Cooperation**

First, the deterring power must have the Capability to damage an enemy. Second, it must Communicate that capability *and intention* to the enemy. There have been instances in history when this communication was muffed—one recalls the lead-up to Iraq’s invasion of Kuwait in 1990 when Saddam seemed to get the impression from the US ambassador that the US would *not* intervene if he moved against his neighbor to the south. We failed to communicate our policy effectively.

Third, the target of deterrence must believe that the threat is Credible. It must believe that its opponent has the power to hurt it, and that it has the political will to do so.

This must Concern the enemy. He must worry that such damage will be so severe that it will make his own goals unattainable at a reasonable price or even cost him his life or position. He must therefore make a rational calculation as to relative costs.

And finally, the enemy must “Cooperate.” And by that I mean, after making the above calculus, he must be *willing* to be deterred.

“No power on earth can shake the German Reich now. Divine Providence has willed it that I carry through the fulfillment of the Germanic task.”

Adolf Hitler

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Therein lies the rub. One could certainly argue that Adolf Hitler was simply undeterrable. He *knew* the allies were opposed to his invasion of Poland; he *knew* that, finally, they would act against him. He *knew* that it would hurt; but none of that mattered. His mind was already made up. Nothing that Britain and France could have said or done would have deterred him from attacking Poland and thus initiating World War II in Europe. He saw it as his destiny.

“Not a single item in our trillion-dollar arsenal can compare with the genius of the suicide bomber—the breakthrough weapon of our time. Our intelligence systems cannot locate him, our arsenal cannot deter him, and, all too often, our soldiers cannot stop him before it is too late. A man of invincible conviction—call it delusion, if you will—armed with explosives stolen or purchased for a handful of soiled bills can have a strategic impact that staggers governments. Abetted by the global media, the suicide bomber is the wonder of the age.”

Ralph Peters

Today of course we have a different and in some ways an even worse problem. I confess to not being a fan of Ralph Peters, but in this instance I think he got it right. The terrorist suicide bombers seem undeterrable, with no amount of military might able to sway them from their self-appointed mission of death. If deterrence does not work against such people, it would seem we would have to move either up or down the scale of power to find a remedy—we must either dissuade the terrorists—change their minds as to the value of diversity, democracy and freedom—or we must destroy them. I’m not sure which of those is more practical.

After World War II the US Air Force also had a problem with the deterrence issue, albeit of a different nature. Deterrence of the Soviet Union was based on a policy of “massive retaliation,” and that was dependent on the nuclear might of Strategic Air Command (SAC). For its motto, SAC stated, paradoxically, that “peace was its profession”—an echo of the Roman adage, and paradox, that if you want peace you should prepare for war. As time went on, this incongruous stance led to misunderstanding and even ridicule. In the highly entertaining movie, *Dr Strangelove*, the fictional Gen “Buck” Turgidson, the SAC commander, argues that nuclear war wouldn’t be all that bad.

“I’m not saying we wouldn’t get our hair mussed. But I do say no more than ten to twenty million killed, tops. Uh, depending on the breaks. “

What’s 20 million casualties? Recall that the facetious subtitle of this movie was “Or, how I learned to stop worrying and love the bomb.” Although I must confess that *Dr Strangelove* remains one of my favorite films, this was indeed a devastating satire on the Air Force and its stated policy-paradox that their ability to destroy the world was a good and humane thing.

So how can we sum up this first and most enduring paradox of Airpower? First, we must concede that it did NOT deter the outbreak of World War II. But then again, neither did the more conventional forms of military force—and of course, between the wars it was the army and navy of our two countries that received the majority of defense funds. The RAF and the Air Corps received, on average, less than 15 percent of our respective defense budgets during those two decades. But, Airpower did shorten the war—especially in the Pacific

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where strategic bombing, culminating in the two atomic strikes, brought the war to an end prior to the necessity of a bloody invasion.

And airwar was less deadly than its counterparts, as the air theorists had predicted. Perhaps 60 million people died during World War II. Peace groups estimate that perhaps 3 million of those 60 million died during air attack. How did the other 95 percent die? The old fashioned way—they were shelled, shot, starved and gassed to death. At the siege of Leningrad over 1 million Russian civilians perished, and Airpower played almost no role there. During the land campaign on Okinawa in 1945, 160,000 civilians were killed, caught in the crossfire between the opposing armies—that is twice as many as died in Tokyo or Hiroshima due to air attacks. And then of course there was the Holocaust. The fact is, *despite* the satire of *Dr Strangelove*, it is this very paradox, that airwar is so horrible it will be humanizing, which *still* rests at the heart of nuclear deterrence theory today.

“The end of the world will come when some enormous boiler shall explode and blow up the globe. And they [the Americans] are great boilermakers.”
Jules Verne

In fact, it is precisely because we are so well prepared to wage nuclear war that we have been able to deter its occurrence and thus forestall the gloomy prediction of Jules Verne.

Which in turn leads us to our second paradox of Airpower: **“Because we’re so good, we no longer have to fight”**. In other words, the better we get at fighting, the less we have to worry about actually doing so.

After the first Gulf War in 1991 and ten years of air patrol operations over Iraq that followed, the Iraqi air force knew better than to contest control of the air. I don’t believe a single Iraqi aircraft even took off in the 2003 campaign. Instead, we found some of their best fighters buried in the desert in an attempt to protect them from coalition Airpower. Dwell on that for a second. I can’t think of another instance when a country’s military has been so petrified of another country’s military might. The Iraqis were not just afraid of *flying* their aircraft, they were afraid of *parking* them! You may recall that in 1991 they parked many of their aircraft next to civilian objects like mosques and archeological sites, knowing that we wouldn’t hit them due the fear of collateral damage. In 2003 they realized that even that wouldn’t save them—their aircraft could be destroyed *without* collateral damage. So they buried them.

“Our problem was, we always made it look too easy.”
Gen Carl Spaatz, USAF

But sometimes we make it look too easy, as our very first USAF Chief of Staff noted. I say this because during the past 15 years, Airpower proved decisive in the first Persian Gulf War—atrriting all 48 of Iraq’s frontline divisions by over 50 percent *before* ground operations officially began. In other words, the Iraqi army was, by definition, “combat ineffective” before our ground assault even started. After the war, the US Air Force downsized by 40 percent while reorganizing itself for peacetime operations. General Tony McPeak disbanded SAC and Military Airlift Command, rolling their assets into the new Air Combat Command

and Air Mobility Command. He instituted a new wing organizational structure and a new promotion system—he even found time to inflict on us the blessedly short-lived Total Quality Management program and design a new AF uniform. The USAF then flew over 300,000 combat sorties over Iraq in Northern and Southern Watch while simultaneously restructuring itself again, this time for war, into an Air Expeditionary Force. Airpower proved to be the decisive military force in Bosnia—leading to the Dayton peace accords, and in Kosovo—leading to the liberation of Kosovo. It was decisive in Afghanistan where it teamed with a few hundred special operations troops to make world-beaters out of the previously ineffective anti-Taliban forces. And of course in Iraq it paved the way for the 3-week campaign to take Baghdad, despite the sandstorms. In northern Iraq airpower, combined with special operations forces and Kurds, overcame 12 Iraqi divisions. Now, the USAF is re-cocked and ready to fight again. If Transformation is defined as revolutionary technology combined with organizational change and radically new doctrines to employ those new technologies and structures, then the USAF epitomizes Transformation. And I might add, it has done these things—conduct combat operations non-stop for the past 15 years—without whining about ops tempo, demanding that the other services do its mission for it, or begging for more money to pay for what normally is considered its main job. That is quite a legacy.

The truth is, we have been incredibly successful in achieving and maintaining air superiority—perhaps Airpower’s most important role—over the past six decades. This speaks for itself:

- **US Army has not fought without air superiority since Kasserine Pass (Feb 1943)**
- **US Army has not lost a soldier to an enemy aircraft since 1953**
- **US Army has never shot a SAM at an enemy aircraft in anger—the bad guys never got that close**
- **F-15 and F-16 are 175-0 in air-to-air combat, worldwide**

I would also comment that a friend of mine when seeing these facts asked why the US Army even *has* any AAA in their inventory since they haven’t had to use it in over fifty years. Good question. I would note however, that, somewhat paradoxically, it is not *air* threats that tend to bother our Airpower. Rather, the greatest danger to our aircraft has come from the ground. Since World War II the US Air Force has lost over 2,700 aircraft in combat, but of those, only slightly more than 200 were lost in air-to-air combat—and none since Vietnam. In other words, since WWII 94 percent of all USAF combat losses have been due ground fire. Of course, even more paradoxically, you can bet that as soon as we stop worrying about the air-to-air threat an adversary will move into that arena to challenge us.

These rather startling statistics lead to another paradox, a subset of the “we’re so good we don’t have to fight” one, which argues, if you aren’t beaten up and bloodied pretty badly in a fight, than you aren’t much of a man – which you might term the “Not fighting fair” paradox. Personally, I subscribe to the school that says “if you’re in a fair fight you didn’t plan it properly.” But this misguided emphasis on a *macho e macho* knife fight is disturbing besides being foolish. You will recall the silly criticism during air operations over Serbia in 1999 that NATO crews were often remaining above 15,000 feet when dropping their bombs, out of AAA range. Despite the fact that such altitudes made the delivery of PGMs more not less accurate, some thought these tactics were somehow unsportsmanlike because it made it difficult for the Serbs to hit us at that height. Of course this paradox leads some to question why we need

the, admittedly, very expensive F-22 if our current inventory is already so good—remember the previous statistic of the F-15 and F-16 being 175 to ZERO in air-to-air combat. A friend of mine, an F-15 pilot, referred to the situation as “Superman hanging up his cape.” He admitted that all of his time spent flying boring orbits over Iraq from 1991 on was a waste of MREs. But of course, that’s precisely the point and the paradox. When you’re that good, you don’t have to fight. The thrust of the critics’ argument seems to be that it is a bit unfair to be so good; that we should give the bad guys a chance.

Which brings us to another paradox: **“The very ability of Airpower to Fight and Win at the Conventional level makes Asymmetrical war increasingly likely”**. Put simply, our dominance, especially in our air and space power, makes it increasingly likely that we won’t be able to use that power. Our adversaries have now been conditioned to avoid those strengths. And so, just as nuclear weapons deterred war down to the conventional level after World War II, so too has our air supremacy deterred war down to the unconventional level. Paradoxically, we have taken ourselves out of the ballgame with our excellence. On the other hand, of course, we must not forget that conventional war may indeed become an attractive option for future adversaries—as soon as we stop preparing for it!

The next Paradox is a bit of an intellectual challenge: **“Airpower’s most unique quality is the most difficult to quantify”**. From the beginning it has been virtually an article of faith for airmen to state that Airpower is an inherently offensive weapon that can have direct and immediate effects at the strategic level of war at the outset of hostilities. This has routinely been seen as one of Airpower’s most unique and important characteristics. As a Billy Mitchell or Hugh Trenchard would have put it, Airpower flies over the armies and fortifications below and strikes directly at a nation’s vital centers. It was then presumed that these strategic attacks would have very significant strategic effects—but when it came time to *quantify* those effects, the train started to run off the rails. Effects-Based Operations, or EBO, is what airmen have always claimed they were conducting in their strategic operations. But putting numbers to those effects has been problematic. This was apparent in World War II and lingered through Vietnam and Desert Storm. In essence, analysts could survey the battlefield, count tank carcasses and attempt to conclude what destroyed them, but attempting to determine what effect that destruction had on the strategic plans and capabilities of the enemy was a far harder nut to crack. Taking it to a higher level, determining what such destruction had on the *mind* of enemy leaders was even more problematic. In my view, we are getting better at this—much better. Our analytical tools are now able to very accurately model and measure air strikes on complex systems. But nay-sayers remain. The US Army especially rejects the entire notion of EBO, preferring instead their Clausewitzian-based attrition model.

This in turn leads to another paradox: **“Our greatest perceived weakness is often our greatest Strength”**. This one is very important. In my view, the inability to hold ground—often considered Airpower’s greatest weakness—is actually one of its greatest strengths. In today’s environment we have discovered that occupation of territory—the alleged sine qua non of ground forces—is often too provocative and too risky to be a useful tool of foreign policy. In Vietnam, for example, the US army high command suggested to President Lyndon Johnson on several occasions that the US invade and occupy North Vietnam to stop the problem at its source. Johnson rejected this advice because he feared such a move, though potentially “decisive” in the army’s terminology, was also too dangerous. It might induce

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Chinese intervention, as had occurred in Korea the previous decade when UN forces moved into North Korea despite Chinese warnings not to do so. Instead and paradoxically, Johnson chose Airpower—although admittedly in a dismally inadequate fashion—precisely because of its alleged greatest weakness—its inability to hold ground.

Similarly, at the outset of Allied Force in Kosovo in 1999, President Bill Clinton and other NATO leaders stated flatly that ground troops would not be used—partly due to opposition within NATO and partly because of warnings from Russia that such an invasion would mean World War III. And so, again, Airpower was chosen because of its greatest weakness.

“The enmity of a defeated population in its home is more dangerous than its hostility on the battlefield.”

Machiavelli

“Of what use is decisive battle if we bleed to death as a result of it?”

Winston Churchill

Today we see in Iraq the cost—politically, financially and in blood—of putting ground troops in harm’s way. Is there a better solution? In Bosnia, Kosovo, Afghanistan and northern Iraq we saw the value in using Airpower, along with special operations forces and indigenous ground troops like the Kosovo Liberation Army, Northern Alliance, and Kurds, to achieve our military objectives in an amazingly effective and efficient manner. Can anyone really argue with a straight face that it is mere coincidence that our greatest successes of the past 15 years, those which not only achieved our political objectives but did so with an amazingly small loss of life, were also the ones that did *not* require the extensive use of conventional US ground forces? Airpower provides political decision makers with more flexible options, with greater agility.

In fact, what we may be seeing is a new paradigm of war emerging that sees **Air and Space Power + SOF + Indigenous Ground Troops + CIA + Information Ops** as the most effective form of warfare. Indeed the present difficulties in Iraq actually make it seem more likely that this paradigm will become popular in the future. Certainly such a paradigm will not work in all situations, but because of its amazing success, it should be considered as a first option in future crises. This in turn leads to another paradox, perhaps an alternate form of the ‘fighting fair’ one I mentioned earlier: **“Dying in war is SO glamorous”**.

“He was from a long great military tradition. Somebody from his family had fought and died in every single American war. I guess you could say he had a lot to live up to.”

Re. “Lieutenant Dan” from *Forrest Gump*

I’m not trying to be flippant here, but when watching the movie *Forrest Gump* again recently I was struck by the scene where we see Lieutenant Dan’s ancestors being killed in combat, one after the other starting with the American Revolution. And then Lieutenant Dan, while in the hospital recovering from his wounds, grabs Gump and shouts angrily that by saving his life Gump had denied him his destiny—his destiny to die gloriously in battle like his ancestors.

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This of course is just a movie. But we cannot allow ourselves to be hoodwinked into thinking that such silly ideas are really what warfare is all about. It is not glorious or noble to get yourself killed in combat. If it is Airpower's duty to deny such people their "destiny" so be it. As George C. Scott playing George Patton stated in that wonderful movie: "Now I want you to remember that no bastard ever won a war by dying for his country. He won it by making the other poor dumb bastard die for his country."

However we now find another paradox which can affect our ability to do just that, namely that: **"Civilian and military leaders cannot resist micromanaging Airpower, precisely because it is so Flexible"**. It is difficult for senior commanders not on the scene to intervene in tactical ground operations. Ground forces are simply too cumbersome, too unwieldy, and usually too out of touch with each other and headquarters to allow such intervention. And so, strategy as defined by ground commanders was the art of bringing forces to the battlefield—the supreme commander would then often sit back and let his subordinates manage the tactical battle. Today the dispersed nature of the modern battlefield often sees commanders thousands of miles behind the lines. With Airpower it is different.

"They can't even bomb an outhouse in North Vietnam without my approval."

Lyndon B. Johnson

Airplanes can take off and head in one direction at 700 knots to conduct a particular strike mission—but then receive orders to change course and go 300 miles in a different direction and do something else. The specific targets they are to strike can be vetted in the Pentagon or the White House, in real time, using air and space-based sensor platforms. The data from those sensors can be beamed via satellite real time into a cockpit, or into the Situation Room in the White House or the Pentagon. This allows senior military and civilian leaders to intervene in air operations at the lowest tactical level imaginable. I wonder if that is a good thing. But, as a good friend of mine once commented in turning an old aphorism on its head: "Flexibility may be the key to Airpower, but more importantly, Airpower is the key to flexibility", or in today's parlance, agility.

Now while I may be sounding a bit cynical, I believe that the next paradox, which is that **"Unpreparedness is the American Way of War"** actually applies to America's entire defense establishment. It is a truism of US military tradition that we enter our wars unprepared: we suffer a humiliating defeat or two, and then we cinch up our belts and get to work. Eventually, we prevail. This policy of non-preparation has actually stood us in fairly good stead over the years—except of course for those unlucky enough to be present at those first few battles. The paradox is that the US was seemingly so *well* prepared going into Vietnam. The size of the military was enormous—in all branches—by far the largest peacetime military organization in our history. The equipment was first-rate—it had to be given that the Soviets outnumbered us by 3 to 1. Our training was similarly superb. Unfortunately, all that force structure, training and doctrine were geared towards a war far different than the one that existed in Vietnam.

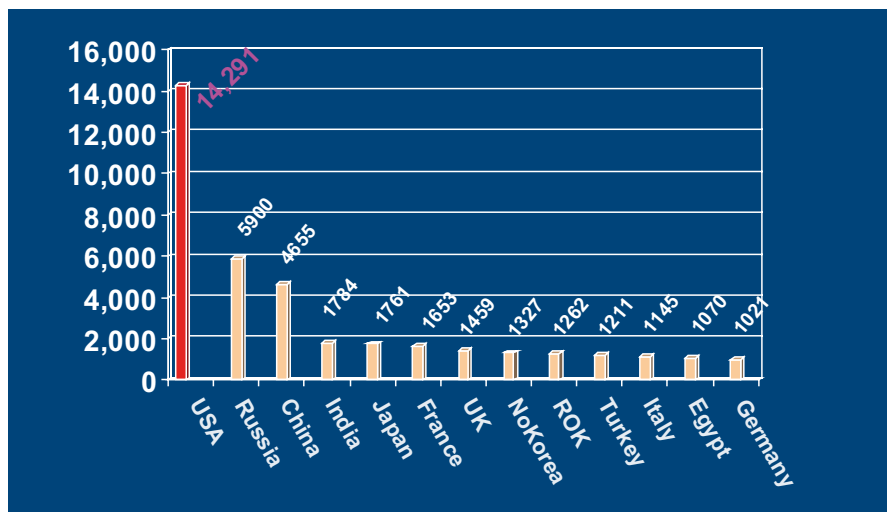
We see a similar situation in Iraq today. All of our incredible high tech weaponry, sensors and intelligence-gathering apparatus are proving deficient in the mundane tasks of occupying territory and locating, identifying and tracking down individual terrorists and whacking them before they strike us first. How do break out of this paradox and begin to better prepare

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ourselves for the war we are *actually in*, not the one we *wish* to be in?

Our next paradox could either be seen as “**Redundancy is also the American Way of War**” or “**Indecision is the Key to Flexibility**”. The cynicism continues. My point here is that Americans pride themselves on their managerial acumen, and we trumpet our Yankee ingenuity, efficiency and productivity in the global business environment. And yet, when it comes to our military structure, we seem to be unable to make firm decisions. As a result, it is one of the oddities of US defense that over the past five decades, despite the changing world situation and despite our varied adversaries and the wars we have fought, the force structure and budget share between the services have remained remarkably stable. But it occurred to me there was a method in our madness. We can *afford* to buy seemingly redundant and superfluous weapons systems, so therefore we do. This puts an enormous burden on any potential enemy. It is not enough that we have the best Air Force in the world, we also have the best navy, and the best army, and the best marine corps, the best space forces, and the best special operations forces. We have so many arrows in our quiver it becomes almost impossible for an adversary to move against us—to find chinks in our armor. At least, paradoxically, when that adversary is a conventional enemy.

Total Military Aircraft, all Types, Worldwide



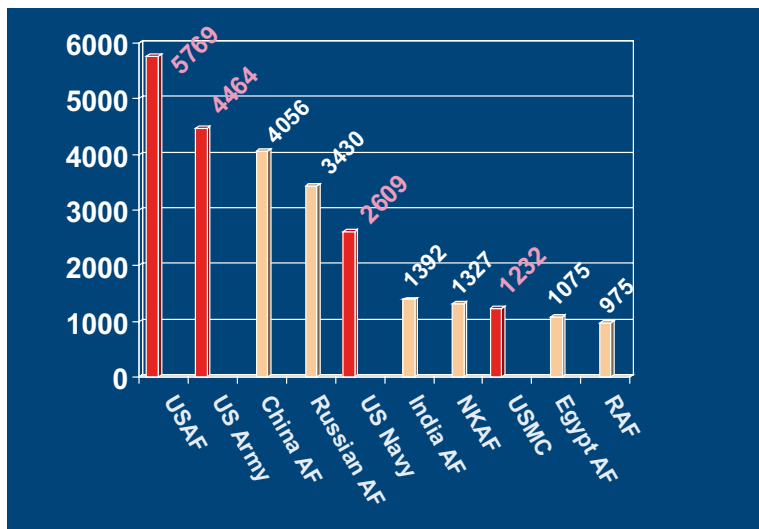
Data from *Aviation Week & Space Technology*, Jan 16, 2006

Here's an example of this redundancy. This chart depicts the total number of military aircraft, of all types, by country. The US has almost triple the number of Russia and China, and nearly ten times the number of most other major countries. And that dominance is actually even greater than it appears. The air arms of Russia and China are aging and budget constrained, thus the US advantage is massive not just in quantity but in *quality* as well. In addition, the US has an enormous array of specialized aircraft—over 900 airlifters and 600 tankers for example—both of those numbers are around 75 percent of the world's total. It is an amazingly diverse force besides being a large and high-quality one.

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One of the supposed weaknesses of Airpower has always been listed as its great cost and complexity—it was difficult for most countries to build a first-rate air force. Well, as you can guess, this paradoxically now means that because we have spent the time and money to build Airpower, we have gained a tremendous, and probably insurmountable, lead over any possible competitors.

Air Arms of the World, All Types



But get this. When looking at the numbers more closely, something else becomes striking and indeed paradoxical. There's an old saying: if you want to know what's important, follow the money. In the US military that path leads to Airpower. If we just look at individual air arms we see that the US Air Force is the largest in the world, and as just noted, the quality of the force is astounding. There are, for example, only 3 stealth aircraft flying today—and all three are in the USAF. But look who is number 2—the US Army. After the marginally effective air forces of Russia and China comes the US Navy, and not too far behind is the US Marine Corps. As an aside here I would note that hardly any other countries in the world even *have* a marine corps, much less a marine corps air arm that is the 8th largest air arm in the world! So whilst the other services may *talk* of sea power and land power and amphibious operations, paradoxically, they put their money in the air. In my view, all the services recognize that Airpower dominates war. Indeed, they love it so much they insist on having a huge air arm of their own. The arguments are not over the value of air and space power, they are over who will control it and for what purpose will they use it.

Let me now shift gears and talk about some of the challenges facing the USAF—some of which may resonate in your own air force—and some of which include paradoxes. I group these challenges into 3 areas, the first I call “Organizational.”

We in the USAF have had some “acquisition difficulties.” Bluntly, about two years ago our second-ranking acquisition official was caught taking bribes. She went to jail. But here's an

ironic paradox: she was a civilian, put in place as a watchdog to monitor the military and ensure it remained honest. The civilian watchdog, not the airmen, turned out to be the crook. When attempting to uncover what went wrong, some US senators got the impression that the USAF was trying to hide something—to stonewall. As a result, the Senate held up confirmation hearings on a number of general officers for up to six months. At the same time, it seemed every other week—I’m exaggerating—one of our large procurement programs was being criticized for being over budget and behind schedule. Basically, the USAF was caught with its flaps down.

What was to be done? First, the new USAF Chief fired, demoted and retired a general officer found guilty of sexual harassment. Character counts. Integrity matters. Second, a new Special Assistant to the AF Secretary for Acquisition, Governance and Transparency was appointed. After taking over this job, the new incumbent was asked about his somewhat unusual title. He responded that the title was designed to send a signal to Congress and the public that the USAF had nothing to hide and that it was cleaning up its act. We would get a handle on managing our programs, on governing. And we would be open—our activities would be transparent for all to see. Certainly that’s a useful start, but I would suspect that it will take more than a new duty title for the USAF to regain the public confidence it lost two years ago.

The second issue concerns culture. The USAF is composed of various tribes and there is often tension between them: pilots vs. navigators vs. non-rated; fighters vs. bombers; tankers vs. airlift; fixed-wing vs. rotary wing, etc. However, just take a look at figures contained in this next table.

Air Force General Officers (3 and 4 Star Level) Backgrounds

4-Star Level	3-Star Level	Total	AF-Wide
12 Total	39 Total	51	~ 73,000
11 Pilots (92%)	31 Pilots (80%)	42 Pilots (82%)	~12,000 (16%)
9 Fighter Plts (75%)	21 Fighter Plts (54%)	30 Fighter Plts (59%)	~ 3,000 (4%)
7 A/S Plts (58%)	8 A/S Plts (21%)	15 A/S Plts (29%)	~ 700 (< 1%)
1 Non-Rated (8%)	8 Non-Rated (21%)	9 Non-Rated (17%)	~ 60,000 (83%)

My point is this we have around 51 generals at the 3 and 4 star level. 82 percent of them are pilots. In fact, around 59 percent of them are fighter pilots. In fact, 29 percent of them are air superiority pilots—58 percent at the 4-star level. Paradoxically, in the USAF there are presently around 73,000 officers, of which only 17 percent are pilots, 4 percent are fighter pilots, and less than 1 percent are air superiority pilots; there seems to be a bit of a bias at our senior command levels! Also, although space consumes nearly 30 percent of our budget, only 5 generals of those 51 have had significant space experience. There has never been a tanker pilot to attain 4 star rank—despite the fact that tankers make up 14 percent of the AF's combat inventory; and only the *first* C-130 pilot has recently pinned on a 4th star.

Why is this a problem? Again, don't misunderstand me: I am in no way impugning the intelligence, dedication, professionalism or capabilities of the current USAF leadership of fighter pilots. Rather, I worry about focus, and specifically myopia. I worry about group think. It is only natural that someone who has spent the better part of his career in a certain weapon system tends to relate to that experience and to see problems through a particular prism—in this case, an air superiority prism. And I would note that our leadership used to be composed almost exclusively of bomber pilots—they too viewed all issues through a bombsight prism. I don't see that as healthy—either then or now. That means our current leadership is associated with the F-22. It is a great airplane, it is transformational, but questions remain about its necessity—recall again my 175-0 figure for the F-15 and F-16 in air-to-air combat. Who will the F-22 fight? Does it have the range to overcome the access challenge, especially in an Asian scenario? Does it have a credible air-to-ground capability that will allow it take out double-digit SAM defenses so as to allow the vast bulk of our strike aircraft—which are non-stealthy—to penetrate enemy air space?

In the theoretical or intellectual realm, the greatest challenge the US Air Force faces is to show its relevance to the war on terror. Unfortunately, there is a complication here—the current operations in Iraq. Some services have been very successful in equating the Global War on Terror (GWOT) with Iraq. They are not the same thing. They are significantly different problems with different solutions. The GWOT is a long-term challenge; our current operations in Iraq are a short term problem—by that I mean, there will be a presidential election in less than two years. I would be surprised if there has not been a significant reduction in our ground troop presence by then. Moreover, given this experience—which has been, to say the least, a nasty surprise to the American military and its political leaders—what are the odds that we will engage in similar such invasions/occupation duties in the foreseeable future? I would think they are very small indeed. And so, the challenge of airmen is to devise solutions to present operational problems in Iraq, but more importantly, to look beyond Iraq and think through how we can assist in winning the far greater and more long-term challenge of the Global War on Terror.

“As Airmen our perspective is strategic, and as an Air Force our effects are global.”

Gen “Buzz” Moseley

The paradox here is that whilst Airpower is an inherently strategic weapon, “**Our Strategic thinkers are Tactical doers**”. As the current chief states here, our theater is the world; our terrain map of the operational area is a globe. We routinely produce strategic-level effects. As a result, we have often prided ourselves on being the broadest and most strategic thinkers

because we have *had* to be—because our weapon has global range, so must our thinking. In reality, however, that seems often not to be the case. We often tend to be the best tacticians and technicians, not strategists. Partly, I believe, this is because of our unusual history. For decades the US Air Force was dominated by the bomber pilots of SAC. Vietnam destroyed that paradigm—the bulk of the fighting was done by fighter pilots. In the war's aftermath the fighter pilots took over the USAF. But because they had spent decades in a secondary position, honing their tactical skills rather than formulating a strategic vision, the leading fighter generals tended to believe that their mission was to support the army—to conduct tactical support operations, as this quote from a former chief of staff admits.

“Conventional capability in the form of tactical airpower became inextricably tied to air-land warfighting doctrine. The primary role of tactical airpower was support for the close battle—either directly in the form of close air support or indirectly in the form of interdiction.”

Gen Ron Fogleman

This is not a recipe for broad thinking. In a time when the Air Force consisted of both a SAC and a Tactical Air Command (TAC), perhaps the notion that TAC's role focused on support of the army made some sense. But when SAC and TAC were rolled into a single command, Air Command Combat (ACC), then such a notion could no longer work. But, could the fighter pilots who ran TAC, and now ACC, make the required adjustment? It's not clear, and perhaps this is why today so few of our senior joint commanders are airmen. Indeed, of the 11 four-star joint commanders in the US military today, only 2 are airmen, and neither of them are theater commanders. In addition, there are 12, 3-star staff officers on the Joint Staff in Washington—only two are airmen. Do our political leaders question the ability of airmen to think strategically and thus pass them over for senior joint positions? If that is the case, then that is a *painful paradox*. I would note as an aside here that our two most tactically oriented services, the army and marines, now fill six of those 11 strategic level joint command billets, 4 of which are theater commands—another interesting thought.

It is commonly noted that the US is today's sole superpower, but it must be careful—and many would argue we haven't been careful enough—to pull our punches, to not throw our weight around, to seek consensus, to defer to our friends and allies. As a result, for the past 15 years the US has been reluctant to act alone – which brings us to the paradox that “**Military Cooperation with allies becomes more necessary politically, just as it becomes increasingly more difficult militarily**”. Instead, the US seeks a mantle of international authority. In some cases, it's as part of an established alliance—NATO in the Balkans. At other times we cobble together an ad hoc coalition to provide political top-cover and show our internationalist mentality. At the same time, however, our ability to operate effectively with those many countries and especially their militaries, has grown increasingly difficult. Recall the statement by Lord Robertson after Kosovo that Europe risked becoming “military pygmies” next to the US. And we have worked together as an alliance for over five decades! The problems with new allies in ad hoc coalitions are far more difficult.

These interoperability problems will get worse. War is an amazing laboratory. We try new weapons and tactics, by necessity, which we may not have even thought of during periods of peace. These new weapons and tactics then become the new baseline and our capabilities go

up from there. In short, our combat operations in Afghanistan and Iraq, now in their 5th year, have pushed American military capabilities further ahead, and our defense budgets have grown significantly, while at the same time, the capabilities, force structures and defense budgets of our friends have tended to go down. The military interoperability gap grows, paradoxically, just as the political necessity for close relations goes in the opposite direction.

Now I have noted a number of paradoxes of Airpower in the previous pages, and there are no doubt others I have missed. But of these, there is one characteristic that seems to come through in all of them, and indeed, which is inherent in the nature of a paradox—a problem of communication. We as airmen have too often failed to explain what Airpower is; what it can do to address the problems our leaders face; what it *cannot* do. As a result, because we are unable to articulate a clear message, we—and our chosen weapon—are often misunderstood and unappreciated. We become the subject of paradoxes.

The US Air Force understands this. One of General Moseley's first acts as chief was to establish a Strategic Communications director at the two-star level to specifically address this issue of Message. The communication problem begins, I believe, with the basics. What is the mission of the Air Force? This is the mission as articulated last year by the new US Air Force Secretary:

The mission of the United States Air Force is to deliver sovereign options for the defense of the United States of America and its global interests -- to fly and fight in Air, Space, and Cyberspace.

But *behind* this brief statement there must lie something else. Once air superiority, and preferably air supremacy is achieved, it must then be *exploited*. Numerous air and space roles are essential to the successful accomplishment of a joint military operation, but which are too often taken for granted. Deep strike, interdiction, close air support, airlift, ISR, communications relay, weather forecasting, geographic positioning, aerial refueling, aeromedical evacuation, and others are all required components of most military campaigns. Most of these cannot be effectively conducted without air superiority, but even if that superiority is present, these missions must be conducted despite difficulties encountered with distance, terrain, or weather. If those “other” air missions cannot be conducted effectively and efficiently, the entire survival of the joint force is at risk. That is what Airpower does for our nation—it *exploits* the air and space. *We must communicate this!* Mission statements are important to explain and institutionalize these ideas and goals. At the same time, however, I would argue that each individual airman also needs a mission. Certainly, it is important for us to identify with the mission of the organization to which we belong, but that is not good enough. We need a *personal* mission as well. So, I have provided one here.

“The mission of the airman is to plan and use Air and Space Power to achieve objectives with the minimal cost in blood and treasure.”

By that I mean, we must strive to save lives. We must take it as our goal to prevent the necessity of our troops getting in harm's way. This, of course, will not always be possible. Close combat will undoubtedly occur, and our troops will need to fight and perhaps die at enemy hands. But saying *that* is far different from *assuming* that close combat will always and *necessarily* occur or that it should be our primary objective. It is the airman's mission to do all possible to prevent that

eventuality. That means using Airpower to achieve Objectives while putting as Few of our Sons and Daughters as possible within Range of Enemy Fires—to Preclude Close Combat.

I realize that this may be controversial to some, and others will argue that this Mission Statement is a parochial and illusory abstraction. They will say I am claiming the Air Force can win wars “alone” and that airmen are deluding the public into believing that war can be painless, or that we are trying to avoid our responsibility to fly close air support. No. It is not parochial to attempt to save the lives of our soldiers. Such a goal, admittedly, evolves from a unique perspective—an air and space perspective—but that does *not* mean it is antithetical to jointness. Indeed, true jointness, as President George Bush (the elder) once said, is using the right tool for the job at hand. Exposing our most precious assets to risk should never be our first choice. The goal of any military planner, from any service, must be to limit casualties, to both sides, and to suffer them only as absolutely necessary to achieve desired objectives. Such a goal does *not* imply that airmen can win wars alone. Rather, it is a claim—amply confirmed in the conflicts of the past two decades—that in some circumstances Airpower can be the dominant and decisive force in war. Dominance does not mean singularity: the use of land and sea forces will usually be necessary. However, Airpower, because of its reach, speed, precision and inherent stealthiness, is the ideal weapon for achieving the goal of an effective and efficient use of force. That was demonstrated in Desert Storm, in Bosnia, in Kosovo, in Afghanistan and in Iraq in 2003, and, more importantly, it was demonstrated with a remarkably low cost in blood.

And that brings me to my very last point, which is not so much a paradox as a truism, which is that “**Leadership is everything**”, and I cannot stress this enough.

“A military unit, like a piece of spaghetti, can only be led from the front end.”

George Patton

It all begins at the top. Every one of our commanders and supervisors must see it as their duty to impart the vision of Airpower and of their organization to everyone serving under them. They must understand and explain to each individual their role in achieving the mission. It is common at change of command ceremonies to instruct the new boss that the essence of command is responsibility—whatever goes right will be attributed to their leadership and they will be rewarded. Whatever goes wrong will *also* be attributed to their leadership and they will be chastised. Every commander and supervisor must therefore see it as their responsibility to inculcate the goals and the mission of the organization to all of its members. They must lead. They must have a vision. That is why they were put in charge.

In truth, I think both of our air forces are today very fortunate. We have been at war now almost continuously for 15 years. Our commanders are battle hardened, as are our airmen, at all levels. Our forces are probably better trained and equipped than at anytime in their history. Yes, we have challenges to overcome, but in my view they are relatively easy ones—our performance record of continuous success is amazing. We simply have to communicate the facts to our publics, our politicians and our brethren in the other services. We must turn the paradoxes into truisms.

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